Mini System PHIL -05327 **FW350C/22/34**

Service
Service
Service

Service Manual

ReWritable CD COMPATIBLE
COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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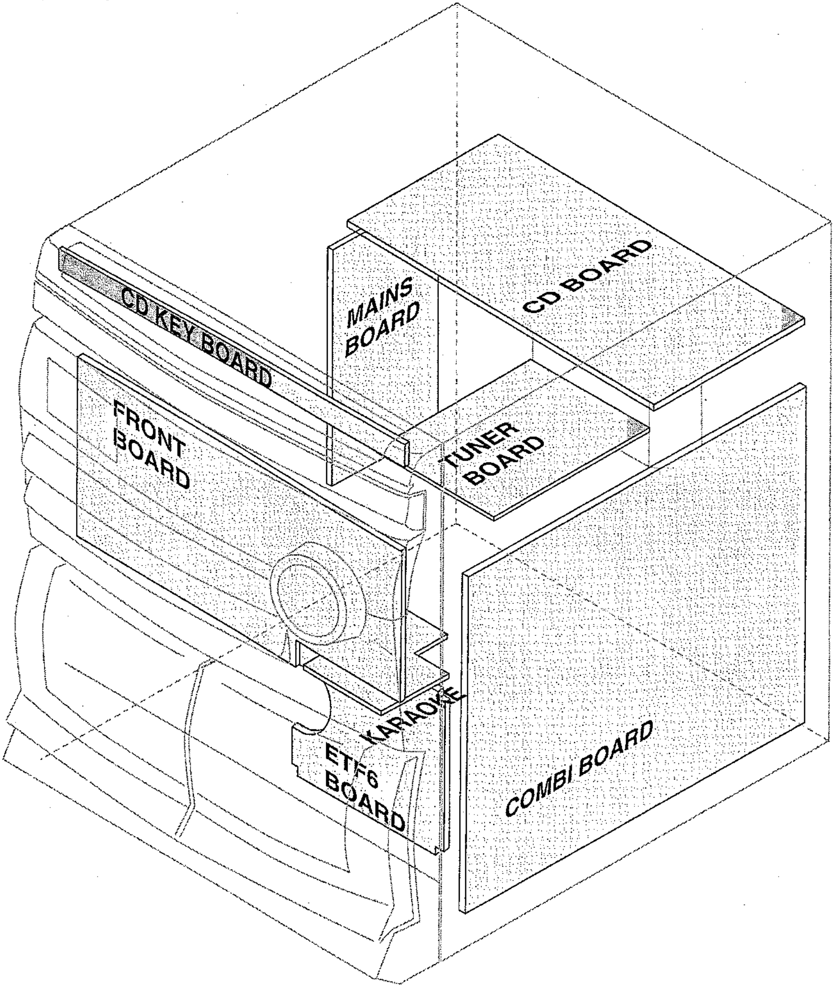
PCS 102 651

PHILIPS

LOCATION OF PC BOARDS


CD KEY BOARD
MAINS BOARD
CD BOARD
FRONT BOARD
TUNER BOARD
KARAOKE
ETF6 BOARD
COMBI BOARD

VERSION VARIATIONS:

Type /Versions:	FW350C								
Features & Board in used:			/22	/34					
Dolby B									
Incredible Surround									
Karaoke									
News			x	x					
RDS			x	x					
CD Text									
Rotary Encoder (volume control)			x	x					
Voltage Selector									
Aux Input			x	x					
Digital Output									
Headphone Socket			x	x					
Line Output									
Subwoofer Output									
Surround Output									
Matrix Surround Loudspeakers									
Tuner board - ECO5 Sys				x					
Tuner board - Tuner 95			x						
Combi board - Supply 12W			x	x					
Combi board - Supply 18W									

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
230V for /22/34
240V for /30
Mains frequency : 50/60Hz
Power consumption : < 10W at Standby
35W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 330mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7μV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 8μV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 6.0mV/M]
Selectivity at 18kHz bandwidth : [> 22dB]
IF rejection : [> 40dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 5%]

AMPLIFIER:

Output power 1) : 2 x 10W @ 6 ohm ± 1dB
Frequency response within ±3dB : 50Hz-15kHz
Dynamic Bass Boost : DBB ON, DBB Off 2)
Digital Sound Control : Jazz, Techno, Optimal, Rock 2)
Aux-in : 700mV ± 3dB at 600ohm
Headphone : 15mW at 32ohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.6 x 4.76 cm/sec
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio (type I) : > 48dBA

COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 2dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Total Harmonic Distortion : < 0.003%
Channel Unbalance : < 1dB
Channel separation at 1kHz : > 60dB
De-emphasis : 0 or 15/50 μS (Switched by subcode on the disc)

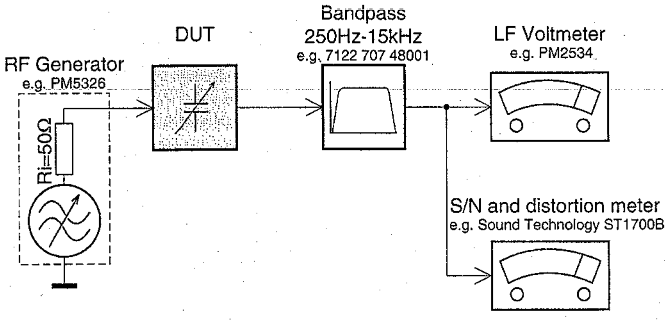
[....] Values indicated are for "Tuner 95 Board" only

1) 1kHz, 10% THD

2) *Frequency response in each setting is software controlled.*

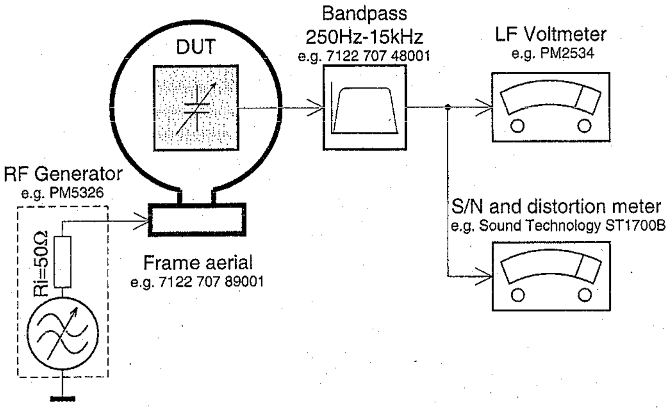
MEASUREMENT SETUP

Tuner FM


RF Generator
e.g. PM5326
Ri=50Ω
DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

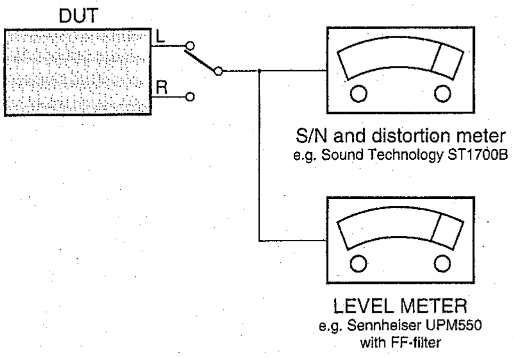
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

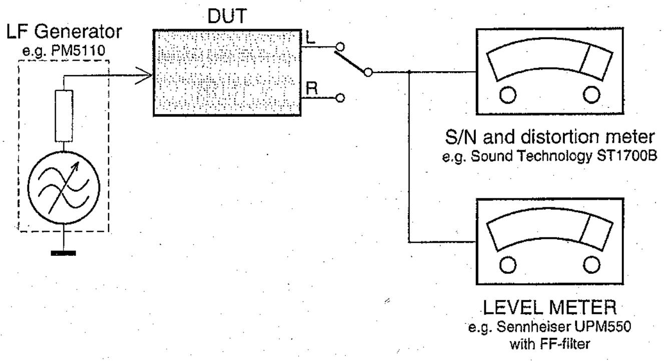
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

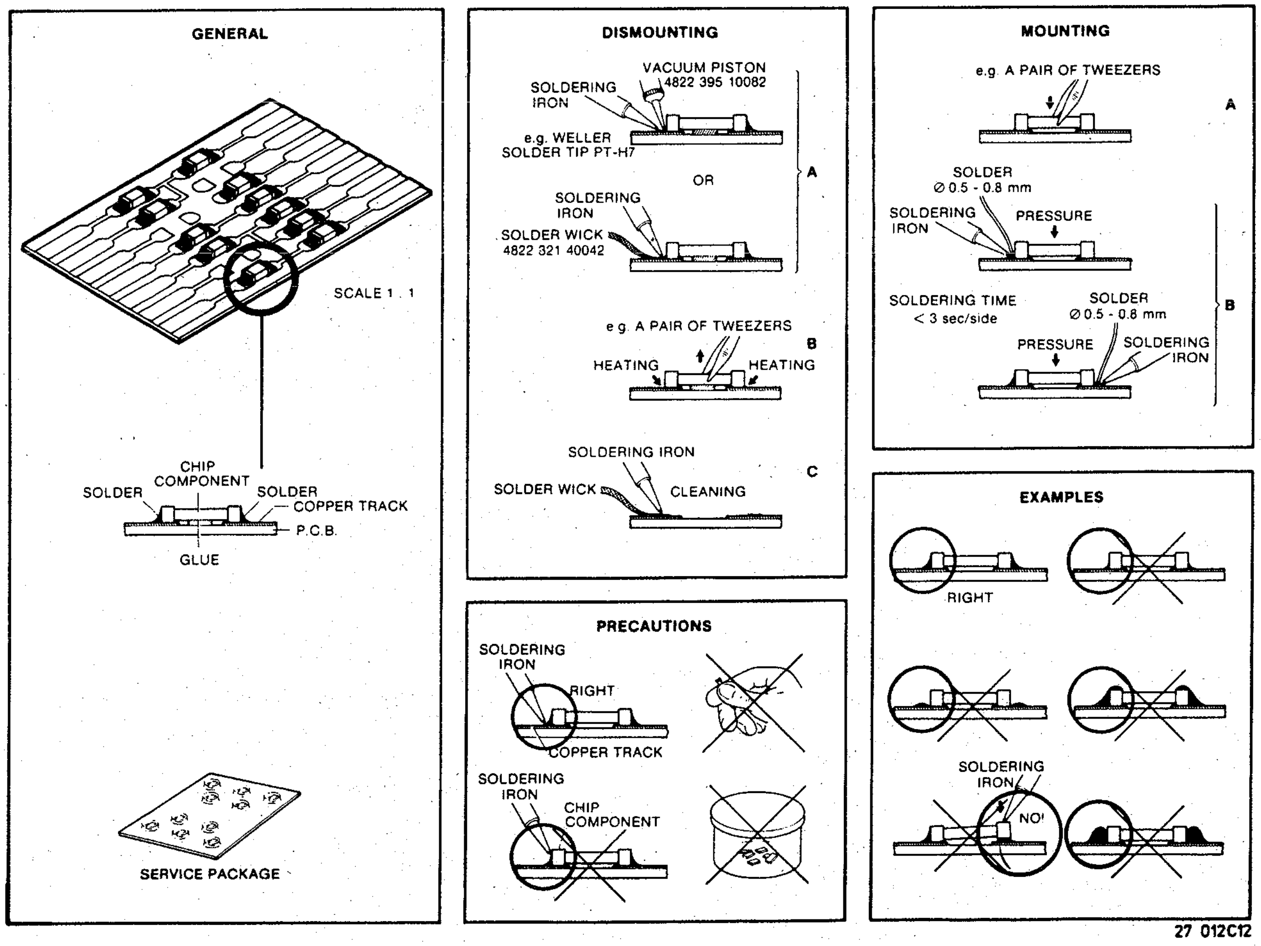
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
A
SOLDERING IRON
SOLDER WICK
4822 321 40042
e.g. A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
C
SOLDER WICK
CLEANING
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
Ø 0.5 - 0.8 mm
B
PRESSURE
SOLDERING IRON
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!

27 012C12

ESD

GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agreés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

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GENERAL INFORMATION

General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Accessories *(Supplied)*

– Remote control
– Batteries (2 x AA size) for remote control
– AM loop antenna
– FM wire antenna
– AC power cord

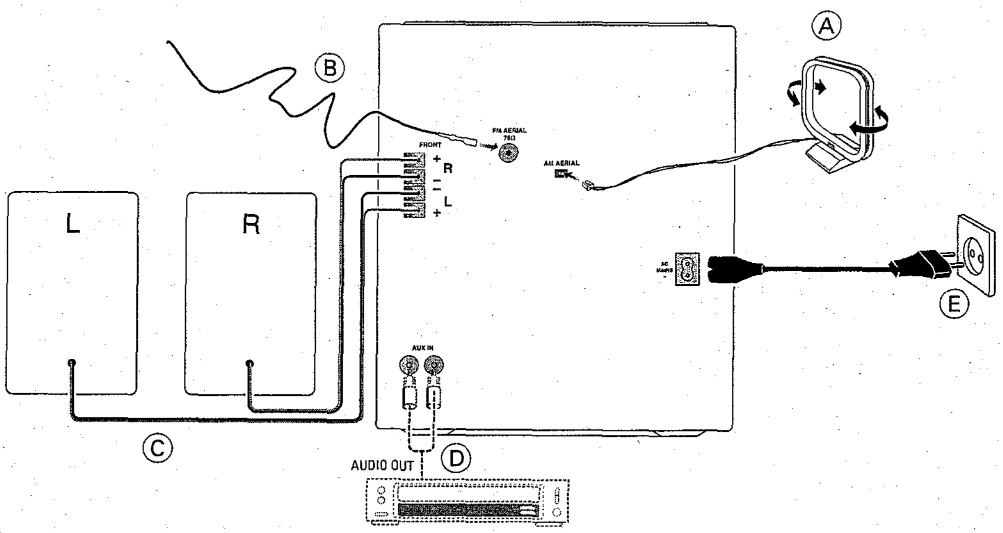
SAFETY INFORMATION

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



PREPARATION

Ⓐ AM Loop Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

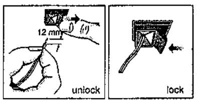
Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna
For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speaker Connections

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.


12 mm
unlock
lock

Ⓓ Connecting other equipment to your system

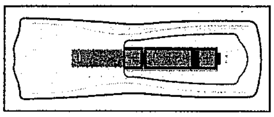
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc or DVD player to the AUX IN terminals at the rear of the system.

Ⓔ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

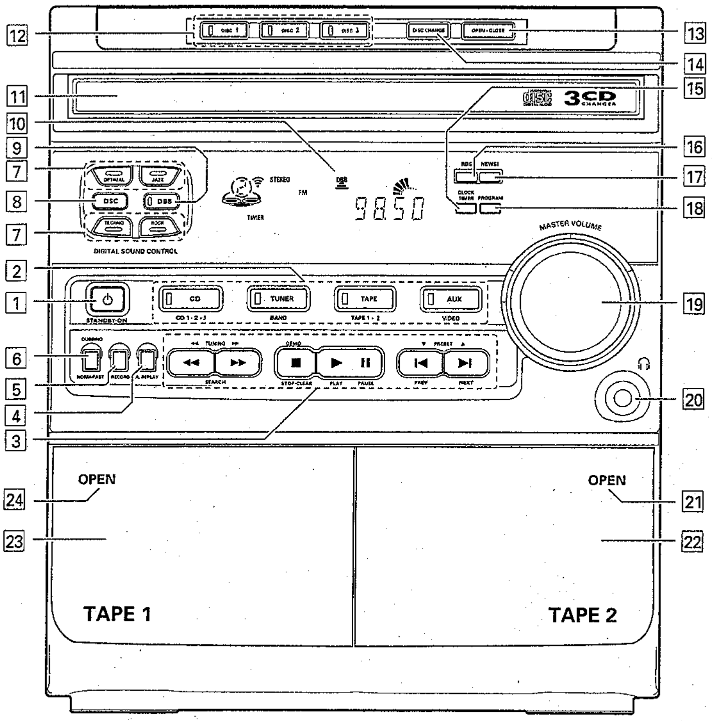
Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

CONTROLS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13
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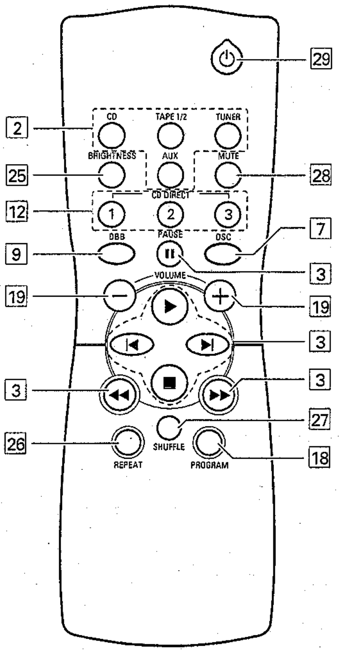
18
7
2
1
19
6
5
4
3
20
24
21
23
22
DISC 1
DISC 2
DISC 3
DISC CHANGE
OPEN•CLOSE
3CD CHANGER
OPTIMAL
JAZZ
DSC
DBB
TECHNO
ROCK
DIGITAL SOUND CONTROL
STEREO
FM
TIMER
RDS
NEWS
CLOCK TIMER
PROGRAM
98.50
MASTER VOLUME
STANDBY-ON
CD
CD 1•2•3
TUNER
BAND
TAPE
TAPE 1•2
AUX
VIDEO
DUBBING
NORM/FAST
RECORD
A.REPLAY
TUNING
SEARCH
DEMO
STOP•CLEAR
PLAY
PAUSE
PRESET
PREV
NEXT
OPEN
OPEN
TAPE 1
TAPE 2


29
2
CD
TAPE 1/2
TUNER
25
BRIGHTNESS
AUX
MUTE
28
12
CD DIRECT
1
2
3
9
DBB
PAUSE
DSC
7
3
19
VOLUME
19
3
3
3
27
26
SHUFFLE
REPEAT
PROGRAM
18

CONTROLS

Controls on the system and remote control

1 STANDBY-ON
- to switch the system on or to standby mode.
- to store radio stations automatically by pressing and holding for 5 seconds.

2 SOURCE : to select the following.

CD / (CD 1•2•3)
- to select CD mode. When CD in stop mode; to select the disc tray 1, 2 or 3.

TUNER / (BAND)
- to select Tuner mode. When in tuner mode; to select the waveband: FM, MW or LW.

TAPE / (TAPE 1• 2)
- to select Tape mode. When tape in stop mode; to select either tape deck 1 or 2.

AUX / (VIDEO)
- to select sound from an external source (e.g. TV, Laser Disc, DVD or VCR player).

3 MODE SELECTION

SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)

for CD .... to search backward/ forward.
for TUNER ..... to tune to a lower or higher radio frequency.
for TAPE .... to rewind or fast forward on tape deck 2 only.

STOP•CLEAR ■ (DEMO)

for CD .... to stop CD playback or clear a program.
for TUNER ..... to stop programming.
for TAPE .... to stop playback or recording.
DEMO .... to start or stop demonstration mode *(on the system only)* .

PLAY ▶ / PAUSE II

for CD .... to start or interrupt playback.
for TAPE .... to start playback.

PREV I◀ / NEXT ▶I (PRESET ▼ ▲)

for CD .... to skip to the beginning of the current or previous/next track.
for TUNER ..... to select a preset station in memory.

4 AUTO REPLAY *(available in tape deck 2 only)*
- to select playback mode either in continuous AUTO PLAY or ONCE only.

5 RECORD
- to start recording on tape deck 2 only.

6 DUBBING
- to dub a tape in normal or fast speed.

7 DIGITAL SOUND CONTROL (DSC)
- to select the desired sound effect : OPTIMAL, JAZZ, ROCK or TECHNO.

8 DIGITAL SOUND CONTROL DISPLAY PANEL
- to view the selected DSC display.

9 DYNAMIC BASS BOOST (DBB)
- to switch on bass boost to enhance bass response or to switch off bass boost.

10 DISPLAY
- to view the current setting of the system.

11 CD CAROUSEL TRAY

12 CD DIRECT PLAY (DISC 1 / DISC 2 / DISC 3)
- to select a CD tray for playback.

13 OPEN•CLOSE
- to open or close the CD carousel tray.

14 DISC CHANGE
- to change CD(s).

15 CLOCK/TIMER
- to view clock, set clock or timer.

16 RDS
- to select RDS data.

17 NEWS!
- to hear news at a preset time automatically.

18 PROGRAM
- to program CD tracks in CD mode or preset radio stations in tuner mode.

19 VOLUME
- to adjust the volume level.

20 🎧
- to connect headphones.

21 OPEN
- to open tape deck 2.

22 TAPE DECK 2

23 TAPE DECK 1

24 OPEN
- to open tape deck 1.

25 BRIGHTNESS *(available in model FW620C only)*
- to adjust the intensity of the display illumination.

26 REPEAT
- to repeat a CD track.

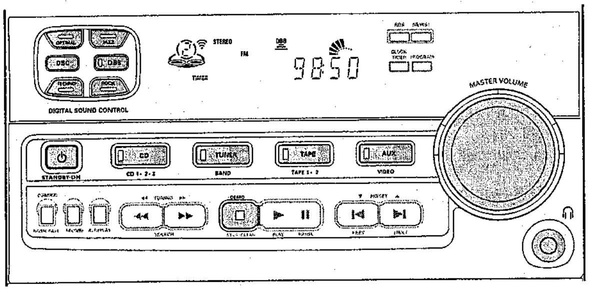
27 SHUFFLE
- to play all the available discs and their tracks in random order.

28 MUTE
- to switch off the sound temporarily.

29 ⏻
- to switch the system to standby mode.

Notes for remote control:
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).***
- ***Then select the desired function (PLAY, NEXT, etc.).***

OPERATING THE SYSTEM



Important:
Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

Note:
- *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
- *When the system is switched to standby mode, the demonstration will resume five seconds later.*

To stop the demonstration mode
- Press and hold **STOP•CLEAR ■** *(on the system only)* for ***five seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → The system will switch to standby mode.

Note:
- *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

To start the demonstration mode
- Press and hold **STOP•CLEAR ■** *(on the system only)* for ***five seconds*** when the system is in standby mode.
  → The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

1 Press and hold **STANDBY•ON** *(on the system only)* for 5 seconds; when the system is in standby or demonstration mode.
→ "EASY SET" will be displayed and followed by "TUNER".
→ EASY SET will start with the last active band.
→ All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

2 The system will proceed to set the RDS time automatically with the stored RDS preset station.

- When searching RDS station;
  → "SEARCH RDS STATION" will be displayed. If no RDS station is available, the program will exit automatically and "NO RDS STATION" will be displayed.
  → After a station is found, "EASY SET" will be displayed and followed by "TIME".
- When searching RDS time;
  → "SEARCH RDS TIME" will be displayed.
  → When RDS time is read, "RDS TIME" will be displayed. The current time is displayed for 2 seconds and will be stored automatically.

Notes :
- *When EASY SET is used, all previously stored radio stations will be erased.*
- *The last preset radio station or the first available RDS station will appear on the display when EASY SET is completed.*
- *If RDS station does not transmit RDS time within 90 seconds, the program will exit automatically and the display will show "NO RDS TIME".*

Switching the system ON

- Press **STANDBY•ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again.
  → The system will switch to standby mode.

OPERATING THE SYSTEM

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  → The display indicates the selected source.

Note:
– *For an external source, make sure that you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals.*

Sound Control

Volume Adjustment
Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening
Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

Digital Sound Control (DSC)
The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

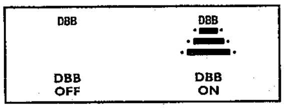
- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, JAZZ, ROCK or TECHNO.
  → The Digital Sound Control display panel will light up respectively.
  → "OPTIMAL, JAZZ, ROCK or TECHNO" will be displayed.

Automatic DSC-DBB selection
The best setting for the DBB is automatically generated for the respective DSC selection. You can manually select the DBB setting that best suits your listening environment.

DSC Selection	DBB On/Off
Optimal →	On
Jazz →	Off
Rock →	Off
Techno →	Off

Dynamic Bass Boost (DBB)
The DBB mode enhances the bass response.

- Press **DBB** to switch on bass response.
  → The DBB button lights up.
  → "DBB ON" will be displayed.



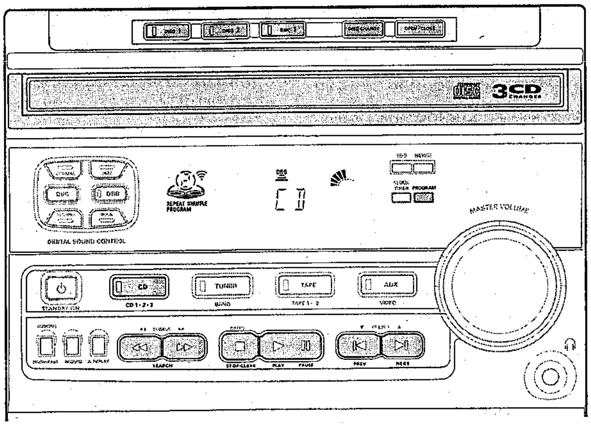
To switch off DBB
- Press **DBB** again.
  → The DBB button light is switched off.
  → "DBB OFF" will be displayed.

Note:
– *Some CDs or tapes might be recorded in high modulation. It may cause a distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

Mute *(only on remote control)*
This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
  → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.

CD



Warning!
1) ***This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.***
2) ***Do not load more than one disc into each tray.***
3) ***When the CD changer is loaded with CD(s), do not turn over or shake the system. This may jam the changer.***

You can load up to three discs in the CD changer for continuous playback without interruption.

Discs for playback

This system can play all audio CD, finalized audio CD-Recordable and finalized audio CD-Rewritable format discs.

COMPACT disc DIGITAL AUDIO   COMPACT disc DIGITAL AUDIO Recordable   COMPACT disc DIGITAL AUDIO ReWritable

Loading the CD Changer

1. Press **CD** to select CD mode.
2. Press **OPEN•CLOSE**.
   → The CD compartment slides out.
3. Load a CD with the printed side up in the right tray.
   - You can load another disc in the left tray.
   - To load the third disc, press the **DISC CHANGE** button.
     → The CD carousel will rotate until the empty tray is ready for loading.
4. Press **OPEN•CLOSE** to close the CD compartment.
   → The total number of tracks and playing time of the last selected disc appear on the display.

CD Direct Play

You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.

– When the button is lighted, it indicates that there is a disc loaded in the disc tray.

Playing a CD

1. Press **PLAY ▶** to start playback.
   → The disc tray, track number and elapsed playing time of the current track appear on the display.
   - To interrupt playback, press **PAUSE II**.
     → The playing time flashes.
   - To resume playback, press **PLAY ▶** again.
2. To stop playback, press **STOP•CLEAR ■**.

Note:
– *All the available discs will play once, then stop. When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.*

Disc Change

You can change the outer 2 discs while the third inner disc is at the stop or playing mode.

1. Press **DISC CHANGE**.
   → The CD compartment slides out.
2. Replace the discs in the left and right disc trays.
   - If you press **DISC CHANGE** again during playback, the CD will stop playing.
     → The CD carousel will rotate until the inner tray is rotated out and is ready for loading.
3. Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track at the stop mode

1. Press **PREV** I◀ or **NEXT** ▶I until the desired track appears on the display.
2. Press **PLAY** ▶ to start playback.
   → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

1. Press **PREV** I◀ or **NEXT** ▶I until the desired track appears on the display.
   → The selected track number and elapsed playing time appear on the display.

- If you press **PREV** I◀ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1. Load the desired discs in the disc trays.
2. Press **PROGRAM** to start programming.
   → The PROGRAM flag starts flashing.
3. Press the **CD** (CD 1•2•3) button to select the disc.
4. Press **PREV** I◀ or **NEXT** ▶I to select the desired track.
5. Press **PROGRAM** to store the track.
   - Repeat steps *3* to *5* to store other discs and tracks.
6. Press **STOP•CLEAR** ■ once to end programming mode.
   → The total number of tracks programmed and total playing time appear on the display.

Notes:

- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears in the display instead of the total playing time.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Playing the program

1. Press **PLAY** ▶ to start program playback.
   → "PLAY PROGRAM" appears on the display.
   → The track number and elapsed playing time of the current track will appear on the display.
   - If you press **REPEAT** during program playback, the current track will be played repeatedly.
     → The REPEAT and PROGRAM flags will be displayed.
2. Press **STOP•CLEAR** ■ to stop program playback.

Note:

- *If you press any of the CD DIRECT PLAY button, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag will also temporarily disappear from the display and then reappear when the playback for the selected disc ends.*

Reviewing the program

Reviewing of the program is only possible in the stop mode.

- Press **PREV** I◀ or **NEXT** ▶I repeatedly to review the programmed tracks.
- Press **STOP•CLEAR** ■ to exit review mode.

Erasing the program (in the stop mode)

- Press **STOP•CLEAR** ■ on the system.
  → "PROGRAM CLEARED" will be displayed.

Note:

- *The program will be erased when the system is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "CLEARED".*

Repeat *(only on remote control)*

It will play the current track repeatedly.

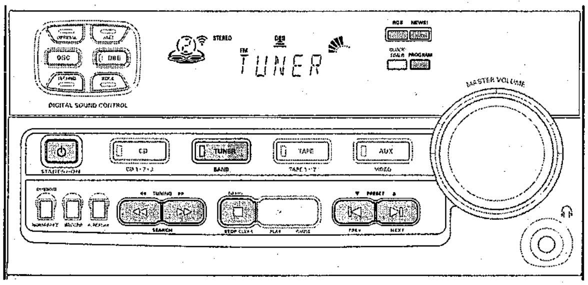
1. Press **REPEAT** during CD playback.
   → "REPEAT TRACK" will be displayed.
   → The REPEAT flag appears on the display.
   - The track will now be played repeatedly until you press **STOP•CLEAR** ■.
2. Press **REPEAT** again to resume normal playback.
   → The REPEAT flag disappears from the display.

Shuffle *(only on remote control)*

It will play all the available discs and their tracks in random order. Shuffle may also be used when tracks are programmed.

To shuffle all the discs and tracks

1. Press **SHUFFLE**.
   → "SHUFFLE" will be displayed.
   → The SHUFFLE flag, the disc and the track selected at random appear on the display.
   - The discs and the tracks will now be played in random order until you press **STOP•CLEAR** ■.
   - If you press **REPEAT** during shuffling, the current track will be played repeatedly.
     → The REPEAT and SHUFFLE flags will be displayed.
2. Press **SHUFFLE** again to resume normal playback.
   → The SHUFFLE flag disappears from the display.



Easy Set *(only in Standby or Demonstration mode)*

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

1. Press and hold **STANDBY•ON** *(on the system only)* for 5 seconds; when the system is in standby or demonstration mode.
   → "EASY SET" will be displayed and followed by "TUNER".
   → EASY SET will start with the last active band.
   → All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.
2. The system will proceed to set the RDS time automatically with the stored RDS preset station.

- If no RDS station is available in the first preset station, the program will exit automatically.
- When searching RDS station;
  → "SEARCH RDS STATION" will be displayed. If no RDS station is available, the program will exit automatically and "NO RDS STATION" will be displayed.
  → After a station is found, "EASY SET" will be displayed and followed by "TIME".
- When searching RDS time;
  → "SEARCH RDS TIME" will be displayed.
  → When RDS time is read, "RDS TIME" will be displayed. The current time is displayed for 2 seconds and will be stored automatically.

Notes :

- *When EASY SET is used, all previously stored radio stations will be erased.*
- *The last preset radio station or the first available RDS station will appear on the display when EASY SET is completed.*
- *If RDS station does not transmit RDS time within 90 seconds, the program will exit automatically and the display will show "NO RDS TIME".*

Tuning to radio stations

1. Press **TUNER** to select TUNER mode.
   → "TUNER" will be displayed.
   A few seconds later, the current frequency will be displayed.
2. Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3. Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
   → The display will show 'SEARCH' until a radio station with sufficient signal strength is found.
   - Repeat this procedure until the desired station is reached.
   - To tune to a weak station, briefly press **TUNING** ◀◀ or ▶▶ until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER**.
2 Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3 Press **PROGRAM** for more than one second.
   → PROGRAM flag starts flashing and 'AUTO' will be displayed.
   → Every available station for the selected waveband will be stored automatically. The frequency and preset number will be displayed briefly.
   → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
   → The system will remain tuned to the last stored preset radio station.

- Repeat the above procedure to store other preset radio stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:

- *You can cancel the automatic programming by pressing PROGRAM or STOP•CLEAR ■ on the system only.*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER**.
2 Press **TUNER** (BAND) to select the desired waveband : FM, MW or LW.
3 Press **PROGRAM** for less than one second.
   → PROGRAM flag, the frequency and preset number start flashing.
   → The next available preset number will be displayed for selection.
4 Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.

- If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.

5 Press **PROGRAM** again.
   → PROGRAM flag will stop flashing, and the radio station will be stored.

- Repeat the above procedure to store other preset radio stations.

Notes:

- *When 40 radio stations are stored and you attempt to store another radio station, the display will show "PROGRAM FULL". If you want to change an existing preset number, repeat steps 4 and 5.*
- *You can cancel manual programming by pressing STOP•CLEAR ■ on the system only.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET** ▼ or ▲ to select the desired preset number.
   → The preset number, frequency and waveband appear on the display

Receiving RDS radio station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The station name is displayed.
- **FREQUENCY:** The frequency of the station is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (and the station name will appear on the display:

- The display normally shows the radio station name if available. By repeatedly pressing **RDS** button you can change the type of display information:
   → The display shows in turn:
   STATION NAME → FREQUENCY → PROGRAM TYPE → RADIO TEXT → STATION NAME ...

Note:

- *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Time

Some RDS station may be transmitting a real time clock at an interval of every minute.

Setting the time with RDS clock

1 Press **CLOCK/TIMER**.
   → "- - : - -" or current time appears on the display.
2 Press **CLOCK/TIMER** once more to enter clock setting mode.
   → "00:00" or current time starts flashing.
3 Press **RDS**.
   → The message "SEARCH RDS TIME" will be displayed.

   → If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
   → When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.

News *(only available in Radio Station with RDS)*

You can activate NEWS function in Standby or any source mode except Tuner mode. Once the News PTY (program type) is detected in a RDS station, it will switch to TUNER mode automatically.

To start NEWS function

1 Press **NEWS**.

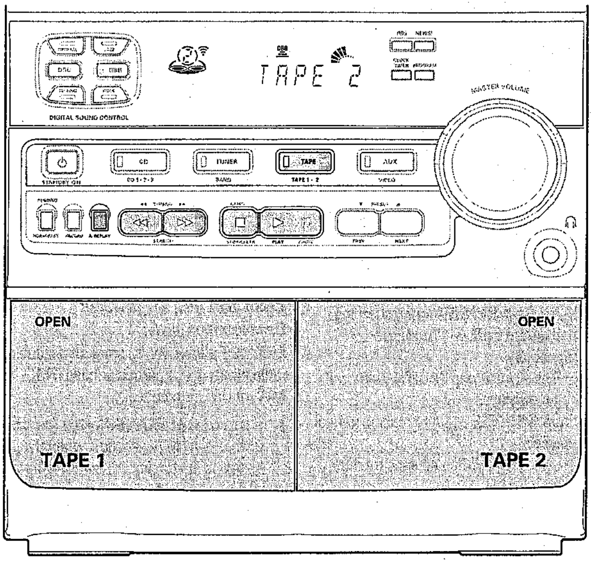
- The NEWS flag and "NEWS ON" will be displayed.
- It will search for the first available RDS station in the presets and wait for the News PTY (program type) to be available. During News PTY search :
   → If **NEWS** activate from Standby or Demo mode, the display will show "WAITING FOR NEWS".
   → If **NEWS** is activated from CD, Tape or Aux mode, the current source activity will be remain uninterrupted.
   → If no RDS station is found after the search, the News function will be switched off. The display will show "NO RDS NEWS" and NEWS flag will disappear from the display.
- When News transmission is detected, the system will switch to Tuner mode.
   → The NEWS flag starts flashing.
- After News has ended, the last selected source mode will be resumed.
   → The NEWS flag will disappear from the display.

To cancel NEWS function

- Press **NEWS** again.
   → The NEWS flag disappears and "NEWS OFF" will be displayed.

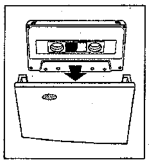
Notes:

- *During NEWS bulletin, you can press any available source button to cancel NEWS function and execute the relevant source mode.*
- *The NEWS works only once for each activation.*
- *If NEWS is activated from Standby or Demonstration mode, it switches to Tuner mode and the sound will be muted until News is available.*



Loading a tape

- Press **OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.



TAPE

Tape Playback

1. Press **TAPE** to select TAPE mode.
   → "TAPE 1" or "TAPE 2" will be displayed.
- Press **TAPE** again to select either tape deck 1 or tape deck 2.
2. Load the tape into the selected tape deck.
3. Press **PLAY** ▶ to start playback.

3a *(For Tape Deck 2 only)*
Press **A. REPLAY** to select the different type of play mode *(see auto replay)*.

4. Press **STOP** ■ to end playback.

Note:
– *When the tape has stopped playing, the system will switch to the standby mode automatically after 15 minutes if no button is pressed.*

Auto Replay *(only on tape deck 2)*

- Press **A. REPLAY** to select either continuous AUTO REPLAY or ONCE during tape playback.
  → "AUTO REPLAY" or "ONCE" will be displayed.

Notes:
– *This feature is available during tape playback only.*
– *When "AUTO REPLAY" is selected, the tape will rewind automatically at the end of playback for the selected side. Then it will start playing again. It will replay up to a maximum of 20 times or when you press STOP* ■.
– *When "ONCE" is selected, the tape will play the selected side once and then stop.*

Rewind/Fast Forward *(only on tape deck 2)*

At the stop mode

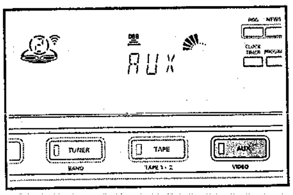
1. You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
   → "《《" or "》》" will be displayed depending on which button is pressed.
   → The tape will stop automatically at the end of the rewinding or fast forwarding.
2. Press **STOP** ■ to stop rewind or fast forward.

During playback

- Press and hold ◀◀ or ▶▶ respectively until the desired passage is located.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
– *During rewinding or fast forwarding of a tape, it is possible to select another source (e.g. CD, TUNER or AUX).*
– *Check and tighten slack tape with a pencil before use. Slack tape may get jammed or may burst in the mechanism.*
– *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
– *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or loudspeaker boxes).*

AUX



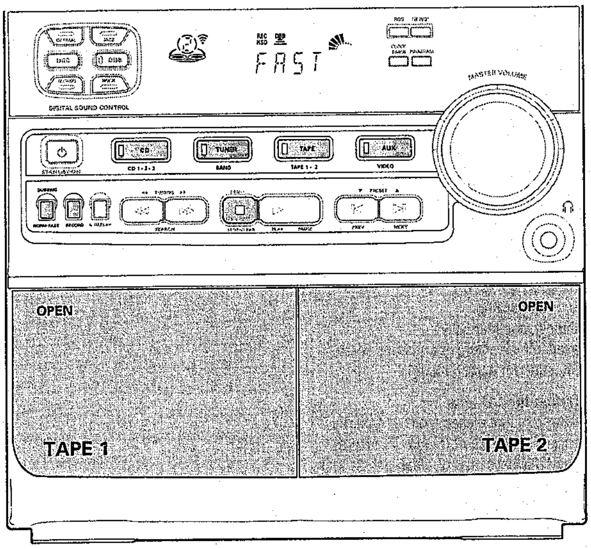
Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX** to select the external mode.
  → "AUX" will be displayed.

Note:
– *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

RECORDING



Notes:
– *For recording, use only tape of IEC type I (normal tape) or IEC type II (Chrome).*
– *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
– *The recording level is set automatically, regardless of the position of VOLUME or DBB.*
– *To prevent accidental recording, break out the tab on the left shoulder of the tape side that you want to protect.*
– *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the Chrome tape detection hole when covering the tab opening.*

One Touch Recording

- For One Touch Recording, as soon as you press **RECORD**, the current source will be recorded on tape deck 2.

1. Load a blank tape in tape deck 2.
2. Press **RECORD** to start recording.
   → REC flag starts flashing.
3. Press **STOP** ■ to stop recording.

Note:
– *When you press RECORD at TAPE mode, "SELECT OTHER SOURCE" will be displayed. One Touch Recording is not possible at TAPE mode.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1. Press **TAPE** to select tape deck 2 .
2. Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2.
   → Make sure that the tape in tape deck 1 has its full spool to the left.
3. Press **DUBBING** ***once*** for normal speed dubbing or ***twice*** *within 2 seconds* for high speed dubbing.
   → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed and then followed by "DUBBING".
   → HSD flag appears on the display for high speed dubbing.
- Dubbing will start immediately.
  → REC flag starts flashing.
4. Press **STOP** ■ to stop dubbing.

Notes:
– *At the end of side A, flip the tapes to side B and repeat the procedure.*
– *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
– *To ensure good dubbing, use tapes of the same length.*
– *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
– *You can switch to other source while dubbing.*

RECORDING

CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into the disc tray.
2 Press **CD** to select CD mode .
   → You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the selected disc.
3 Press **RECORD** to start recording.
   → REC flag starts flashing.
- CD will start playback automatically.
4 Press **STOP** ■ to stop recording.

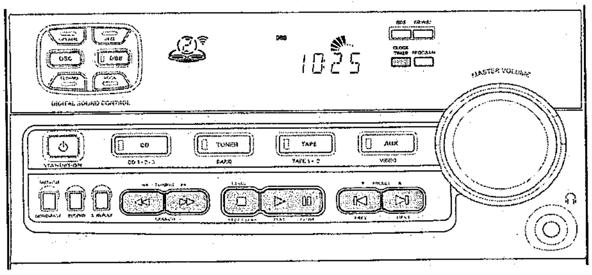
Recording from other sources

(only on tape deck 2)

1 Load a blank tape into tape deck 2.
2 Press **CD**, **TUNER** or **AUX**.
- Start playback of the selected source.
3 Press **RECORD** ● to start recording.
   → REC flag starts flashing.
4 Press **STOP** ■ to stop recording.

Note:
– *During recording, it is not possible to listen to another sound source.*

CLOCK



View Clock

You can view the clock (if it is set) at standby or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK/TIMER** briefly.
   → " 10:25 " (the current time) will be displayed.
   → "- - : - -" will be displayed if the clock is not set.

Clock Setting

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK/TIMER** to select clock mode.
   → "00:00" or the current time starts flashing.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with |◀ or ▶|.
4 Press **CLOCK/TIMER** again to store the setting.
   → The clock starts running.

- To exit without storing the setting, press ■.

Notes:
– *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
– *When a power interruption occurs, the clock setting is erased.*
– *To set the time with RDS clock, see "Receiving RDS Radio Station" under TUNER section.*

TIMER

Timer Setting

- The system can switch on to CD, TUNER or TAPE 1 mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

1 Press and hold **CLOCK/TIMER** for more than 2 seconds to select timer mode.
   → "ON 00:00" or the last set timer starts flashing. The TIMER flag flashes.
   → The last selected source is lighted while other available sources are flashing.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press |◀ or ▶| to set the minute for the timer to start.
5 Press **CLOCK/TIMER** to store the start time.
   → The TIMER is now set.
   → The TIMER flag remains on the display.

TIMER

- To exit without storing the setting, press ■.
- At the preset time, the TIMER will be activated.
   → The selected source will be played.

Notes:
– *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
– *If the source selected is TUNER, the last tuned frequency will be switched on.*
– *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
– *If the source selected is TAPE 1, and if the preset time is reached during high speed dubbing, the TUNER source will be selected instead.*

To cancel the TIMER
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press **II** to cancel the timer.
   → "CANCEL" will be displayed.
   → The TIMER flag disappears from the display.

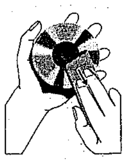
To start the TIMER again *(for the same time)*
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press **CLOCK/TIMER** again to store the start time and the selected source.

MAINTENANCE

Maintenance

Cleaning the Cabinet
- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens
- After prolonged usage, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available. Follow the instructions supplied with the Lens Cleaner.

Cleaning the Heads and the Tape Paths
- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape through once.

Demagnetizing the heads
- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances you should try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.
- The disc is inserted upside down.
- → *Place CD with printed side up.*
- Moisture condensation at the lens.
- → *Wait until lens has adjusted to normal room temperature.*
- There is no disc in the CD tray.
- → *Insert a CD.*
- The CD is dirty, badly scratched or warped.
- → *Clean or replace the CD.*
- The CD lens is dirty or dusty
- → *See section under Maintenance.*

"DISC NOT FINALISED" is displayed.
- The CD-RW or CD-R disc is not properly recorded for the use of a standard CD player.
- → *Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.*
- The CD is badly scratched or dirty.
- → *Replace or clean CD.*

Radio Reception

Poor radio reception
- The signal strength is too weak.
- → *Adjust the antenna.*
- The TV or VCR is too close to the stereo system.
- → *Separate the stereo system from the TV or VCR.*
- → *Connect an external antenna for better reception.*

Tape Deck Operation

"RECORDING ACTIVE" is displayed.
- A recording is in progress.
- → *Stop the recording or wait until it is finished.*

"TAPE DUBBING ONLY" is displayed.
- Tape dubbing is only possible in tape mode.
- → *Switch source to tape mode.*

Recording or playback cannot be made or there is a decrease in audio level.
- *Dirty tape heads, capstans or pressure rollers.*
- → *See section on tape deck maintenance.*
- Magnetic build-up in the record/ playback head.
- → *Use demagnetizing tape.*

General

System does not react when any button is pressed.
- Electrostatic discharge.
- → *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect and switch on the system again.*

No or poor sound.
- Volume is not turned up.
- → *Adjust VOLUME.*
- The system is muted.
- → *Press MUTE to switch on the sound.*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly.*
- → *Make sure that the stripped speaker wire is clamped.*

Reversed left and right sound.
- Speakers are connected wrongly.
- → *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.
- Speakers are connected wrongly.
- → *Check the speaker connection for proper phasing, red/black wires to red/ black terminals.*

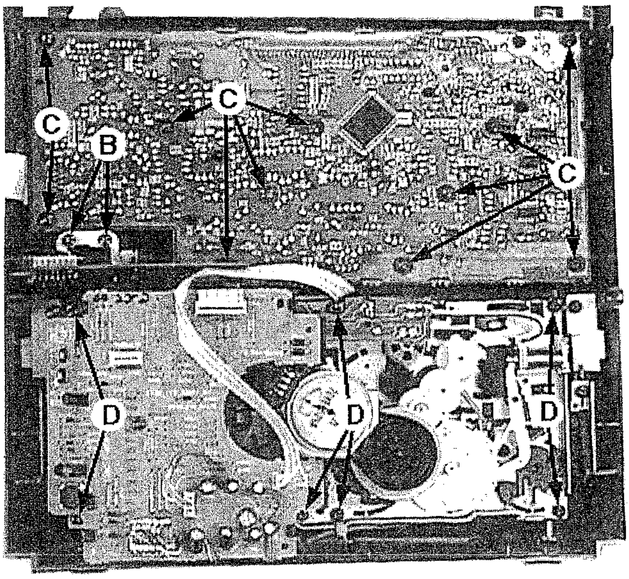
Remote control has no effect on the system.
- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated..*
- Batteries are exhausted.
- → *Replace the batteries.*
- Wrong source is selected.
- → *Select the source (CD, TUNER, etc.) before pressing the function button, (PLAY, PREV/NEXT, etc.).*

Timer not working.
- Timer is not switched on.
- → *Press CLOCK/TIMER to switch on the timer.*
- Dubbing/recording is in progress.
- → *Stop dubbing/recording.*

System displays features automatically; buttons flash continuously.
- Demonstration mode is switched on.
- → *Press and hold ■ for 5 seconds to switch off the demonstration.*

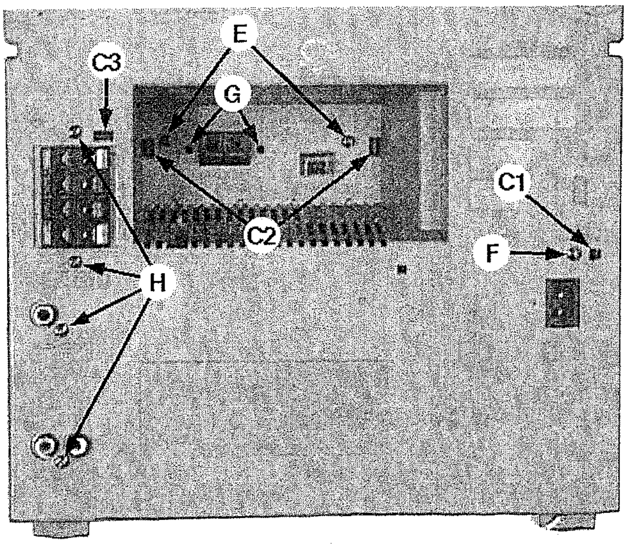
Dismantling of Assemblies on the Front Panel

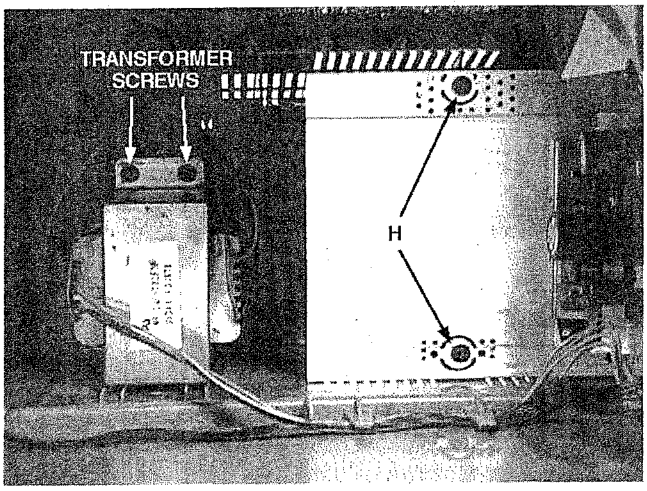
1) Remove 2 screws B to loosen the Karaoke* / Headphone board.
   *Note: Only 1 screw B for non-Karaoke version.
2) Remove 11 screws C as indicated to loosen the Front board.
3) Remove 7 screws D to loosen the ETF Module



Dismantling of Rear Portion

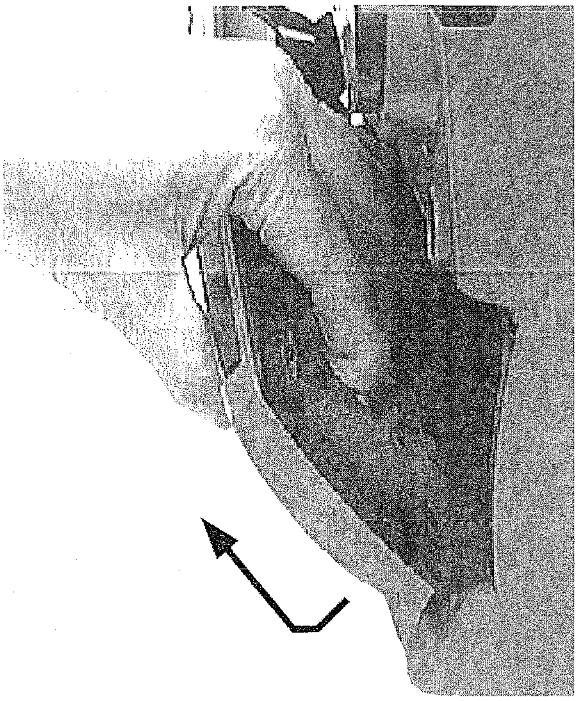
1) Remove 1 screw F & uncatch C1 to loosen the Mains socket pc board.
2) Remove 2 screws E, 2 screws G* and uncatch C2 to loosen the Tuner pc board assembly.
   *Note: Screws G will be deleted after the holes on the rear cabinet are removed.
3) Remove 6 screws H (4x on the rear and 2x on the heatsink) & uncatch C3 to loosen the Combi board (Main part).

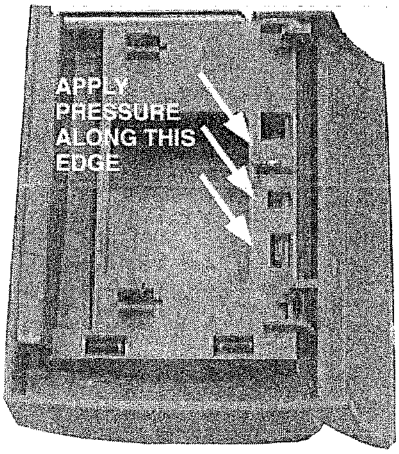




DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

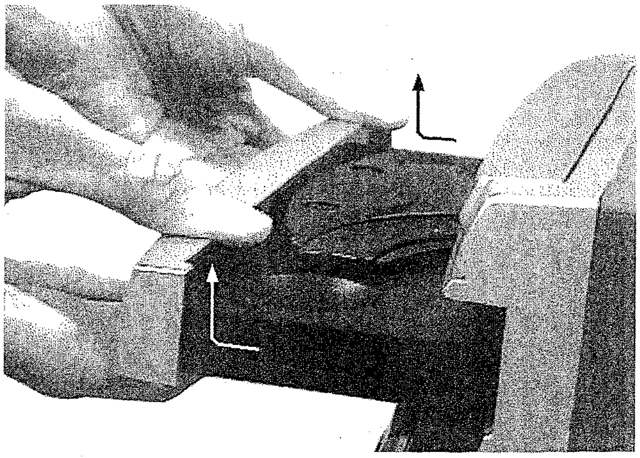


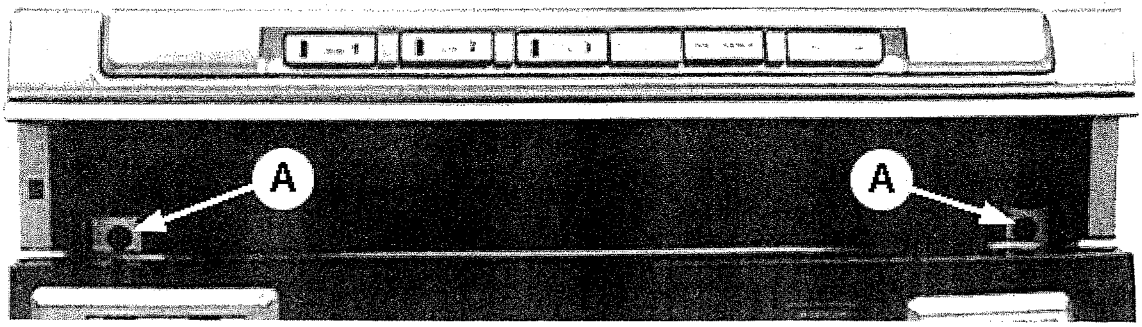


Cassette door

Dismantling of the Front Panel

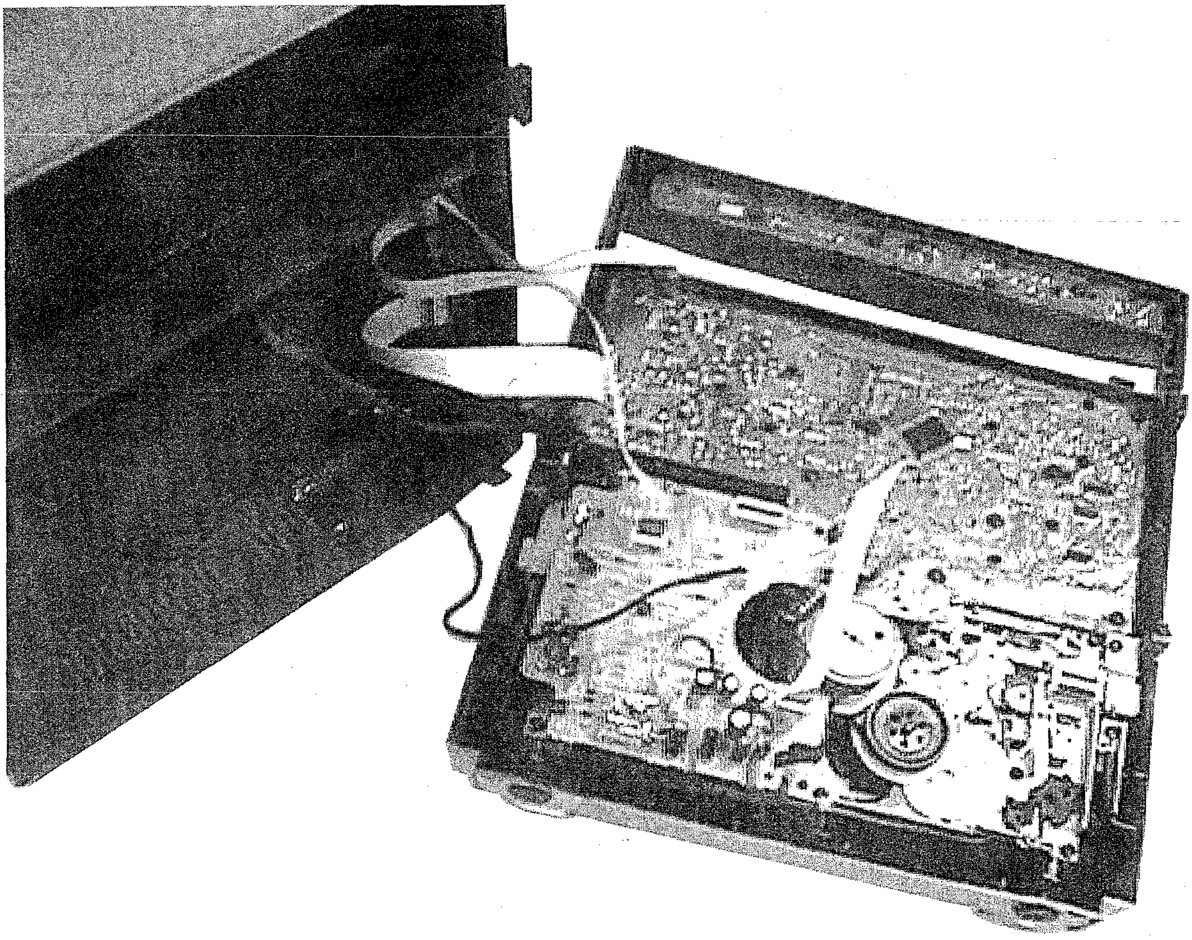
1) Slide out the tray an remove the CDC front cover as indicated.
2) Loosen the 8 screws to separate the Front Panel from the rear portion.
   - 2 screws A on the front
   - 2 screws each on the left & right side
   - 2 screws at the bottom



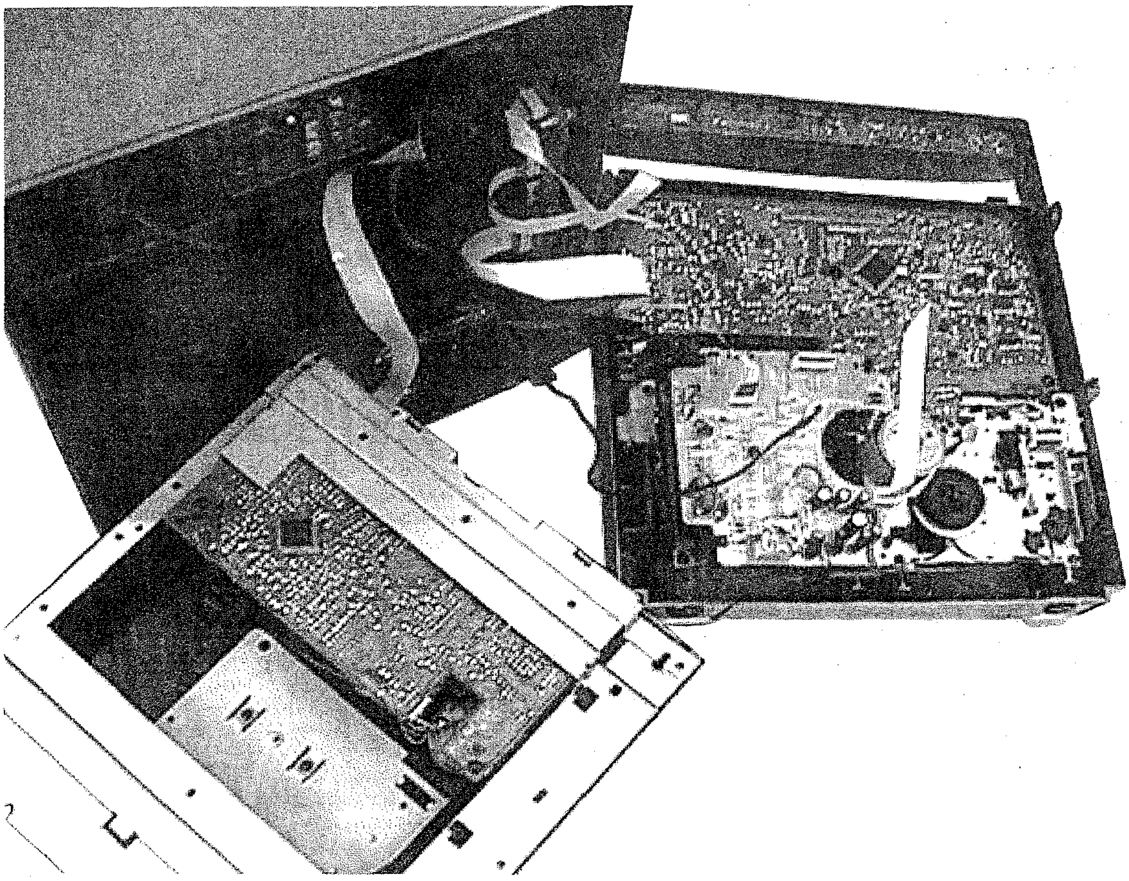


Front CDC Portion

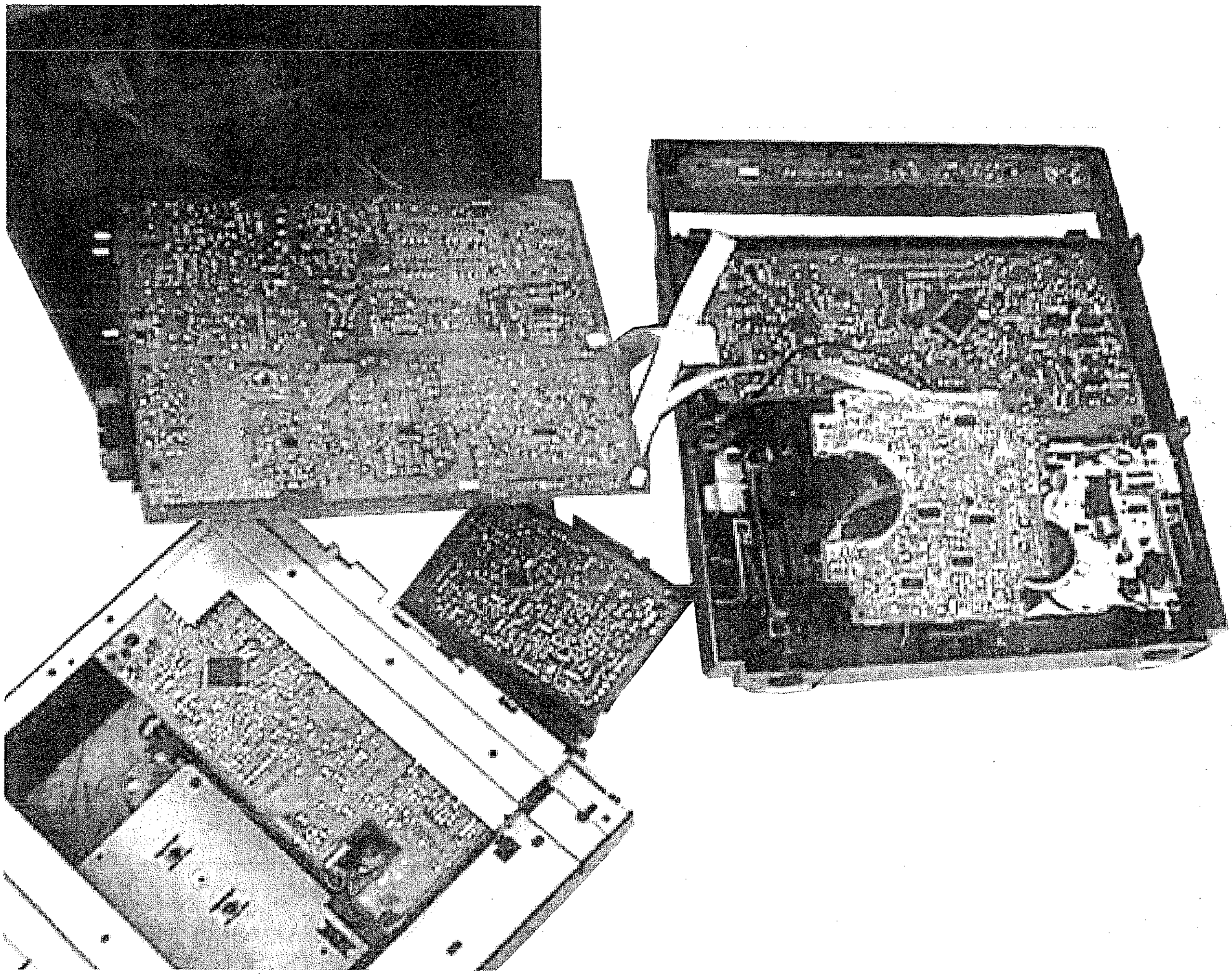
Service pos A



Service pos B

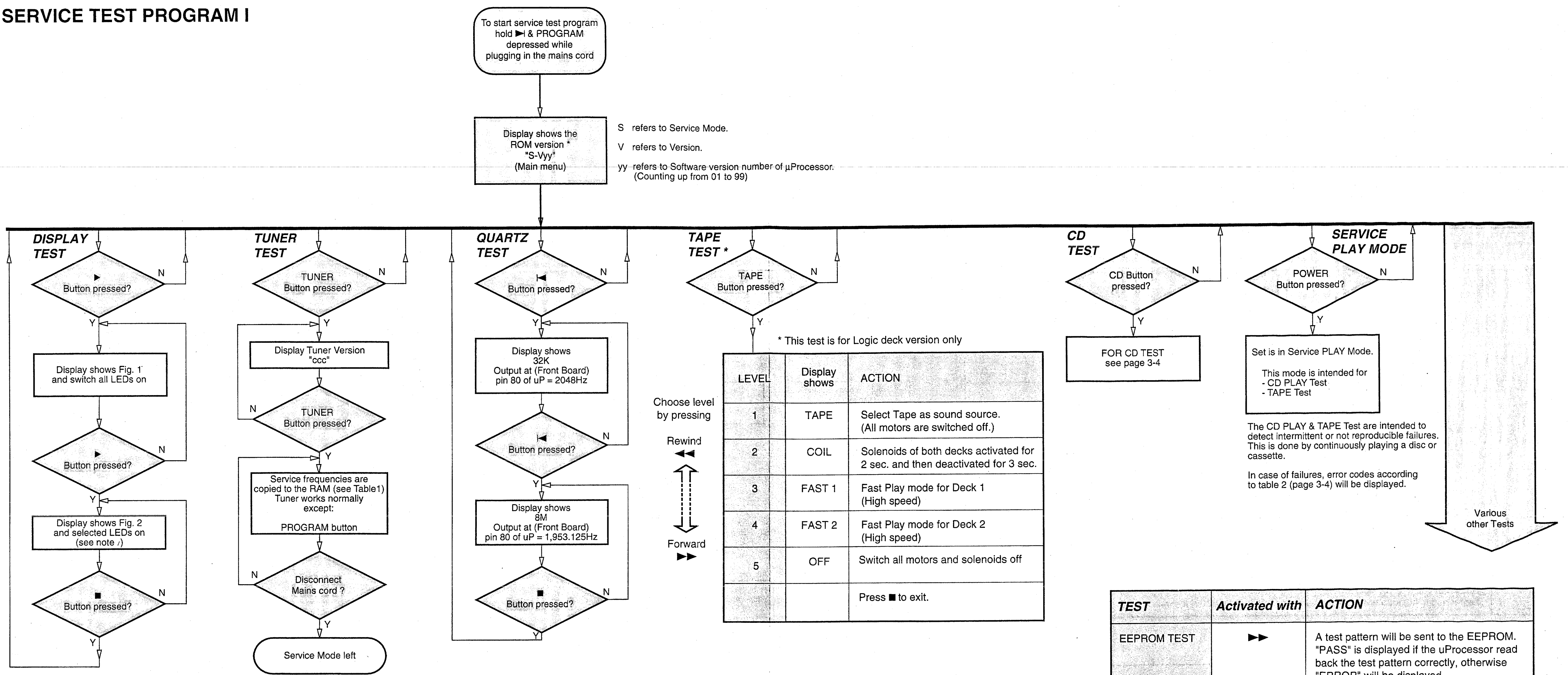


Service pos C



Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex connectors before encasing, otherwise faults may occurs.

SERVICE TEST PROGRAM I


To start service test program hold ▶I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
DISPLAY TEST
▶ Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
N
Y
Display shows Fig. 2 and selected LEDs on (see note /)
■ Button pressed?
N
Y
TUNER TEST
TUNER Button pressed?
N
Y
Display Tuner Version "ccc"
TUNER Button pressed?
N
Y
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
N
Y
Service Mode left
QUARTZ TEST
I◀ Button pressed?
N
Y
Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz
I◀ Button pressed?
N
Y
Display shows 8M Output at (Front Board) pin 80 of uP = 1,953.125Hz
■ Button pressed?
N
Y
TAPE TEST *
TAPE Button pressed?
N
Y
Choose level by pressing
Rewind ◀◀
Forward ▶▶
CD TEST
CD Button pressed?
N
Y
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
N
Y
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
Various other Tests

S refers to Service Mode.

V refers to Version.

yy refers to Software version number of μProcessor. (Counting up from 01 to 99)

* This test is for Logic deck version only

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to table 2 (page 3-4) will be displayed.

PRESET	Europe "EUR"	East Eur. "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz
5	558kHz	558kHz	531kHz	560kHz	558/560kHz
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz
7	153kHz	87.5MHz	558kHz	98MHz	87.5MHz
8	279kHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	198kHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	98MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	87.5MHz	98MHz	65.81MHz	87.5MHz	98MHz

Table 1

East Europe TUNER IF offset correction

1) Input a reference frequency 87.5MHz from the generator.

2) Proceed to the Tuner Test Mode

3) Hold TUNER button down for > 3 seconds

4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".

xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

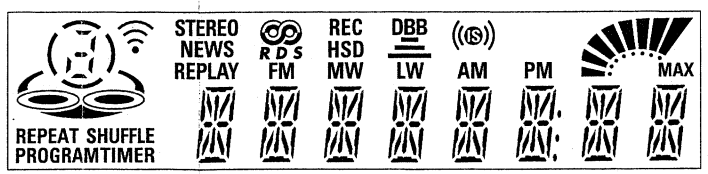
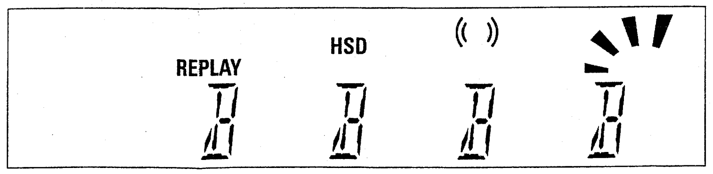

STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAMTIMER

Figure 1



note /: CDC1, CDC3, CD, Tape, Aux, ◀◀, ■ and I◀.

Figure 2

TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶I ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020*	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021*	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

F = Fatal error & the set stop play function W = Warning
* For Logic set only.

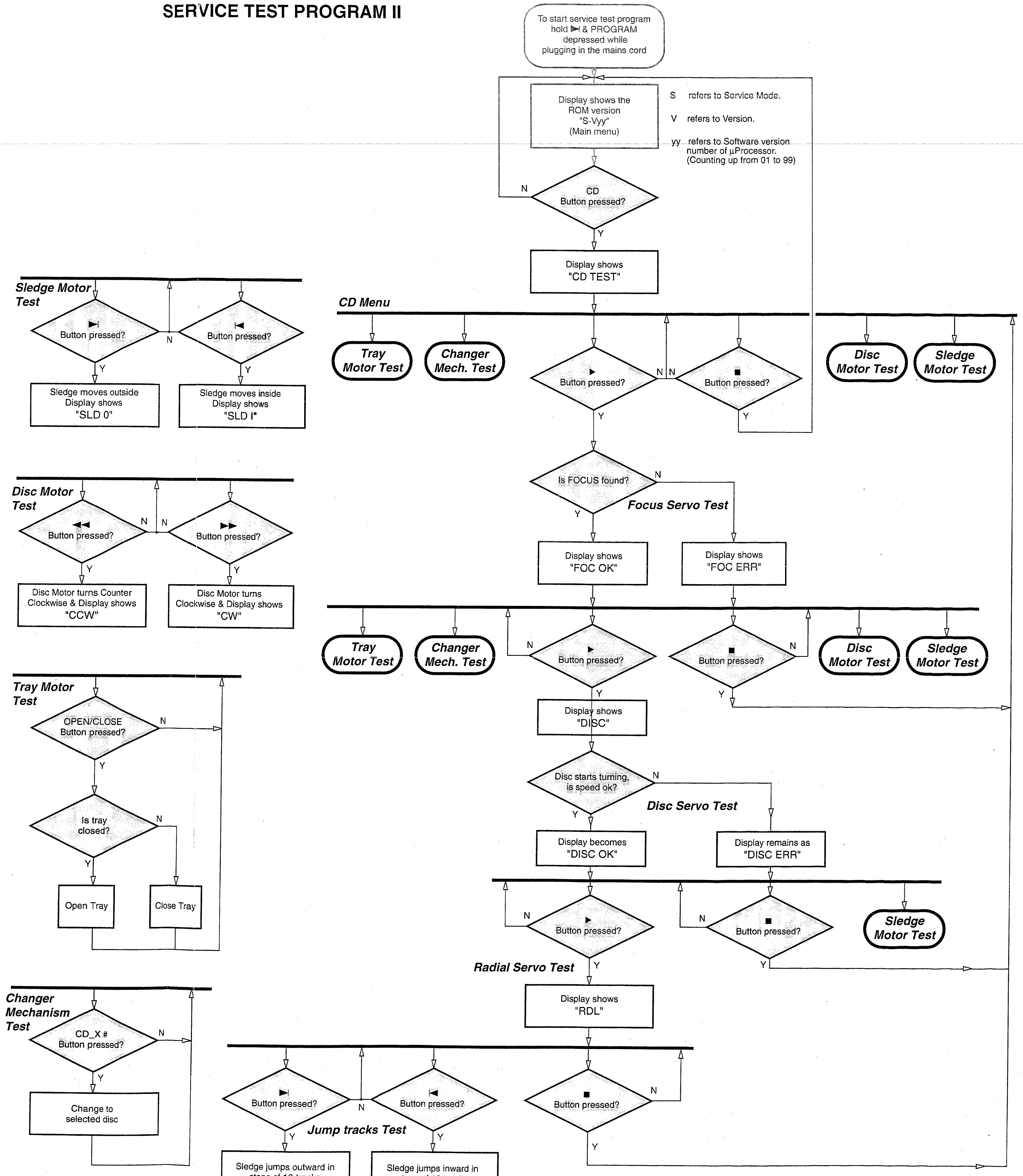
Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	CLOCK /TIMER	10	RECORD *	21
Any Remote control key	RC	PROGRAM	11	REPLAY *	22
CD1 *	1	INCR. SURROUND *	12	◀◀	23
CD2 *	2	VOLUME UP *	13	▶▶	24
CD3 *	3	VOLUME DOWN *	14	■	Exit
DISC CHANGE	4	STANDBY - ON	15	▶II	26
OPEN / CLOSE	5	CD	16	I◀	27
DSC	6	TUNER	17	▶I	28
DBB	7	TAPE	18		
RDS *	8	AUX	19		
NEWS *	9	DUBBING	20		

* Not for all type/version

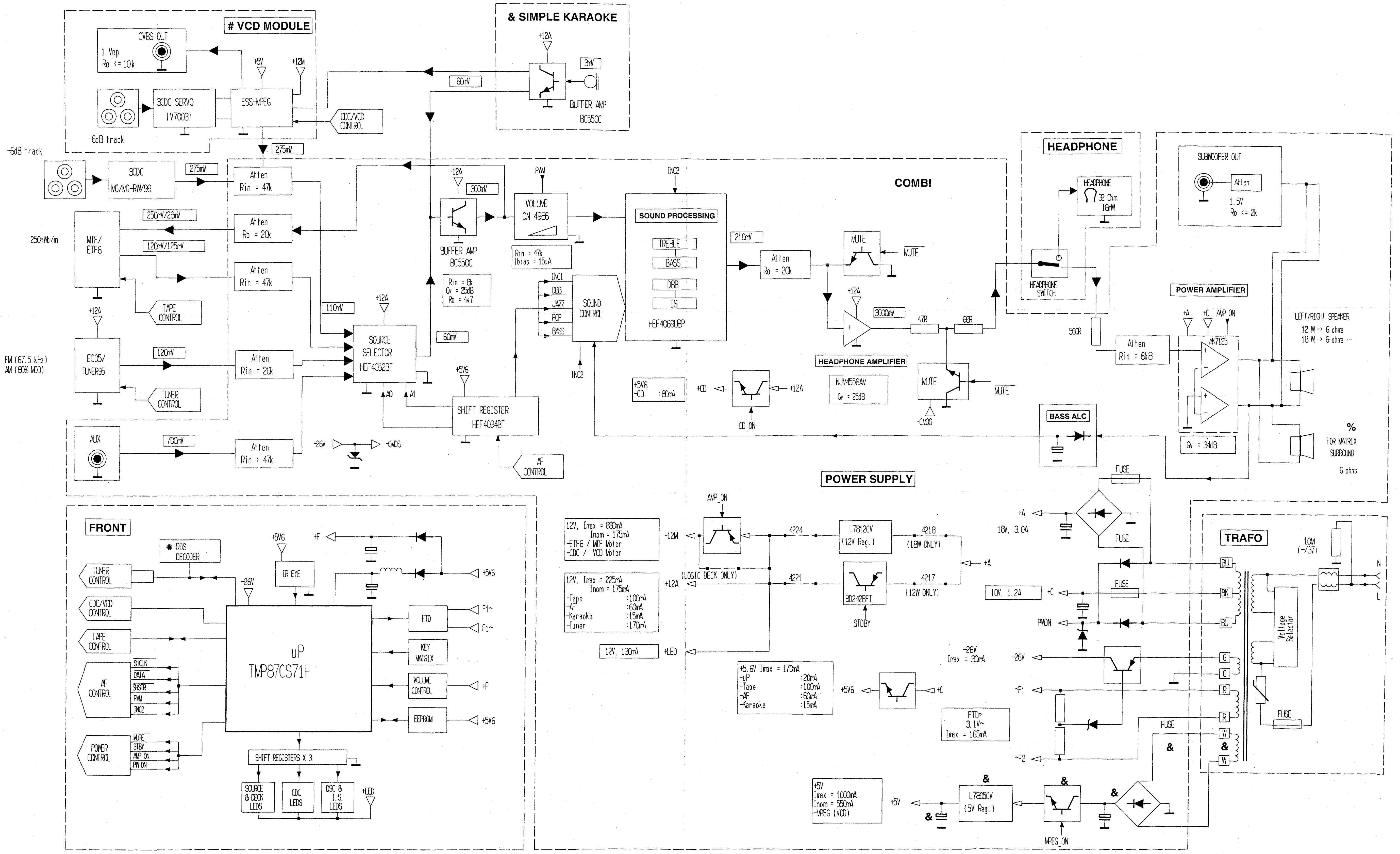
Table 3

SERVICE TEST PROGRAM II


To start service test program hold ▶I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
S refers to Service Mode.
V refers to Version.
yy refers to Software version number of µProcessor. (Counting up from 01 to 99)
CD Button pressed?
N
Y
Display shows "CD TEST"
CD Menu
Tray Motor Test
Changer Mech. Test
▶ Button pressed?
■ Button pressed?
Disc Motor Test
Sledge Motor Test
Is FOCUS found?
Focus Servo Test
Display shows "FOC OK"
Display shows "FOC ERR"
Display shows "DISC"
Disc starts turning, is speed ok?
Disc Servo Test
Display becomes "DISC OK"
Display remains as "DISC ERR"
Radial Servo Test
Display shows "RDL"
▶I Button pressed?
I◀ Button pressed?
Jump tracks Test
Sledge jumps outward in steps of 16-tracks
Sledge jumps inward in steps of 16-tracks
Sledge Motor Test
▶I Button pressed?
I◀ Button pressed?
Sledge moves outside Display shows "SLD 0"
Sledge moves inside Display shows "SLD I"
Disc Motor Test
◀◀ Button pressed?
▶▶ Button pressed?
Disc Motor turns Counter Clockwise & Display shows "CCW"
Disc Motor turns Clockwise & Display shows "CW"
Tray Motor Test
OPEN/CLOSE Button pressed?
Is tray closed?
Open Tray
Close Tray
Changer Mechanism Test
CD_X # Button pressed?
Change to selected disc

# CD_X refers to CD1, CD2 or CD3

SET BLOCK DIAGRAM



# VCD MODULE
CVBS OUT
1 Vpp
Ro <= 10k
3CDC SERVO
(V7003)
ESS-MPEG
+5V
+12M
CDC/VCD CONTROL
-6dB track
275mV
& SIMPLE KARAOKE
+12A
3mV
60mV
BUFFER AMP
BC550C
-6dB track
3CDC
MG/MG-RW/99
275mV
Atten
Rin = 47k
250mV/28mV
250nWb/m
MTF/ETF6
120mV/125mV
Atten
Ro = 20k
Atten
Rin = 47k
TAPE CONTROL
+12A
FM (67.5 kHz)
AM (80% MOD)
EC05/TUNER95
120mV
Atten
Rin = 20k
TUNER CONTROL
AUX
700mV
Atten
Rin > 47k
110mV
+12A
SOURCE SELECTOR
HEF4052BT
A0
A1
60mV
-26V
-CMOS
+5V6
SHIFT REGISTER
HEF4094BT
AF CONTROL
+12A
300mV
BUFFER AMP
BC550C
Rin = 8k
Gv = 25dB
Ro = 4k7
PWM
VOLUME
ON 4986
Rin = 47k
Ibias = 15uA
INC1
DBB
JAZZ
POP
BASS
SOUND CONTROL
INC2
INC2
SOUND PROCESSING
TREBLE
BASS
DBB
IS
HEF4069UBP
COMBI
210mV
Atten
Ro = 20k
MUTE
MUTE
+12A
3000mV
47R
68R
HEADPHONE AMPLIFIER
NJM4556AM
Gv = 25dB
MUTE
MUTE
-CMOS
+5V6
-CD :80mA
+CD
+12A
CD_ON
HEADPHONE
HEADPHONE
32 Ohm
18mW
HEADPHONE SWITCH
560R
Atten
Rin = 6k8
BASS ALC
SUBWOOFER OUT
Atten
1.5V
Ro <= 2k
POWER AMPLIFIER
+A
+C
AMP ON
AN7125
Gv = 34dB
LEFT/RIGHT SPEAKER
12 W -> 6 ohms
18 W -> 6 ohms
%
FOR MATRIX SURROUND
6 ohms
FRONT
RDS DECODER
TUNER CONTROL
CDC/VCD CONTROL
TAPE CONTROL
AF CONTROL
SHCLK
DATA
SHSTR
PWM
INC2
POWER CONTROL
MUTE
STBY
AMP ON
PW ON
+5V6
-26V
IR EYE
+F
+5V6
uP
TMP87CS71F
FTD
F1~
F1~
KEY MATRIX
VOLUME CONTROL
+F
EEPROM
+5V6
SHIFT REGISTERS X 3
SOURCE & DECK LEDS
CDC LEDS
DSC & I.S. LEDS
+LED
POWER SUPPLY
AMP_ON
12V, Imax = 680mA
Inom = 175mA
-ETF6 / MTF Motor
-CDC / VCD Motor
+12M
4224
L7812CV
(12V Reg.)
4218
(18V ONLY)
+A
12V, Imax = 225mA
Inom = 175mA
-Tape :100mA
-AF :60mA
-Karaoke :15mA
-Tuner :170mA
+12A
(LOGIC DECK ONLY)
4221
BD242BFI
STDBY
4217
(12V ONLY)
12V, 130mA
+LED
+5.6V Imax = 170mA
-uP :20mA
-Tape :100mA
-AF :60mA
-Karaoke :15mA
+5V6
+C
FTD~
3.1V~
Imax = 165mA
+A
18V, 3.0A
FUSE
FUSE
FUSE
10V, 1.2A
+C
PWON
-26V
Imax = 30mA
-26V
-F1
-F2
FUSE
&
&
+5V
Imax = 1000mA
Inom = 550mA
-MPEG (VCD)
+5V
&
L7805CV
(5V Reg.)
&
&
MPEG_ON
TRAFO
10M
(-/37)
BU
BK
BU
G
G
R
R
W
W
&
Voltage Selector
FUSE
N
L

LEGEND:

mV AC-SIGNAL LEVEL

SIGNAL FLOW

CONTROL SIGNAL

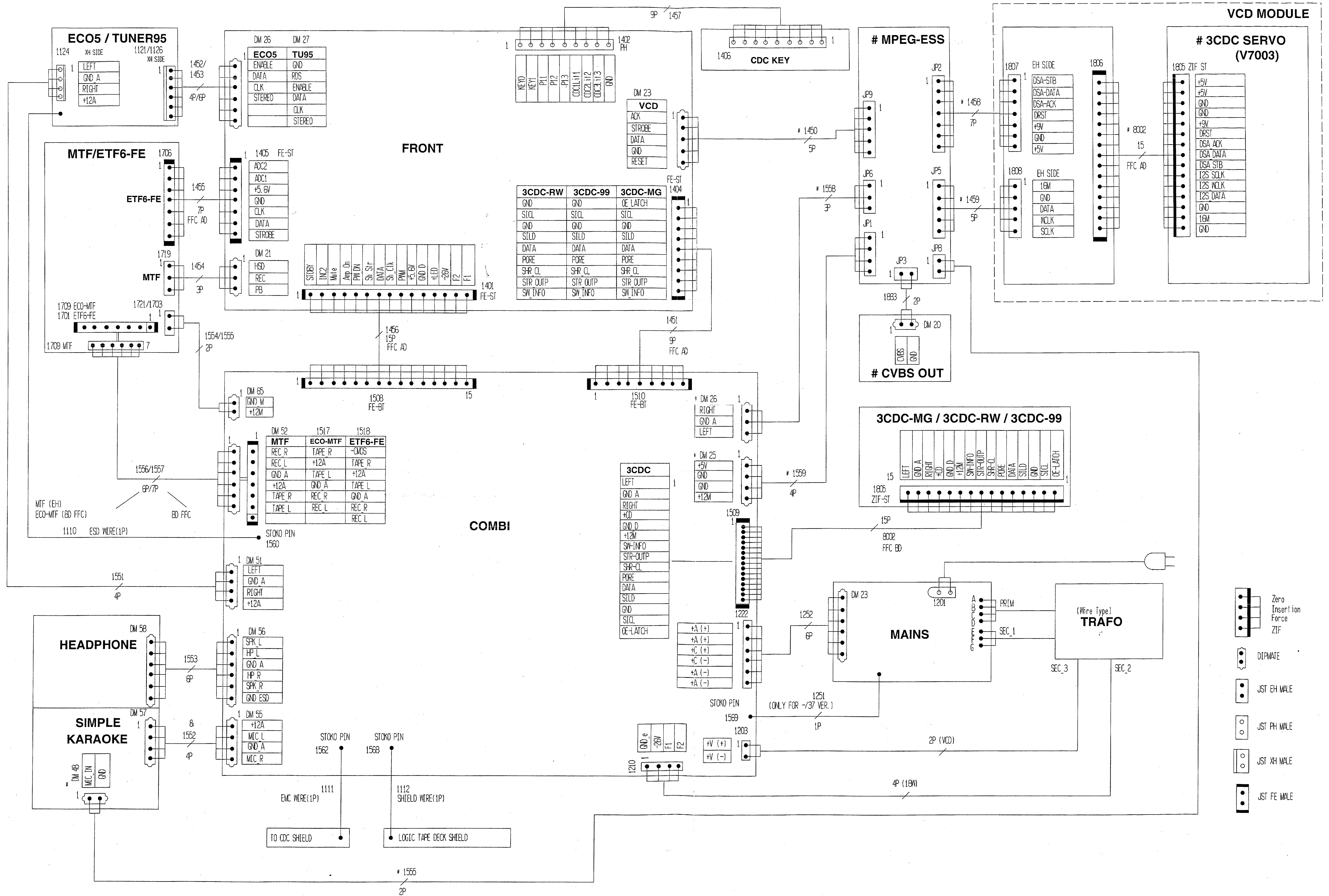
ALL OUTPUTS FROM SOURCES ARE 1kHz, 0dB UNLESS STATED OTHERWISE.

% MATRIX SURR. FEATURE ONLY FOR FW886C, FW896C, FW55C

VCD FEATURE ONLY FOR FW880V/21

& SIMPLE KARAOKE FEATURE FOR -/21 VER.

SET WIRING DIAGRAM


ECO5 / TUNER95
1124 XH SIDE
1121/1126 XH SIDE
LEFT
GND A
RIGHT
+12A
1452/1453
4P/6P
DM 26
DM 27
ECO5
TU95
ENABLE
DATA
CLK
STEREO
GND
RDS
ENABLE
DATA
CLK
STEREO
9P 1457
1402 PH
KEY0
KEY1
P11
P12
P13
CDCLi11
CDC2Li12
CDC3Li13
GND
1406
CDC KEY
DM 23
VCD
ACK
STROBE
DATA
GND
RESET
FRONT
MTF/ETF6-FE
1706
ETF6-FE
1455
7P
FFC AD
1405 FE-ST
ADC2
ADC1
+5.6V
GND
CLK
DATA
STROBE
1719
MTF
1454
3P
DM 21
HSD
REC
PB
1709 ECO-MTF
1701 ETF6-FE
1721/1703
1709 MTF
1554/1555
2P
STBY
IN32
Mute
Amp On
PWR DN
Sh Str
DATA
Sh Clk
PWM
+5.6V
GND D
+LED
-26V
F2
F1
1401 FE-ST
3CDC-RW
3CDC-99
3CDC-MG
GND
SICL
GND
SILD
DATA
PORE
SHR CL
STR OUTP
SW INFO
OE LATCH
FE-ST 1404
1456
15P
FFC AD
1451
9P
FFC AD
# MPEG-ESS
JP9
JP2
# 1458
7P
# 1450
5P
JP6
JP5
# 1558
3P
# 1459
5P
JP1
JP8
JP3
1883
2P
DM 20
CVBS
GND
# CVBS OUT
VCD MODULE
1807 EH SIDE
DSA-STB
DSA-DATA
DSA-ACK
DRST
+9V
GND
+5V
1806
1808 EH SIDE
16M
GND
DATA
WCLK
SCLK
# 8002
15
FFC AD
# 3CDC SERVO
(V7003)
1805 ZIF ST
+5V
+5V
GND
GND
+9V
DRST
DSA ACK
DSA DATA
DSA STB
I2S SCLK
I2S WCLK
I2S DATA
GND
16M
GND
1508 FE-BT
1510 FE-BT
DM 65
GND M
+12M
DM 52
1517
1518
MTF
ECO-MTF
ETF6-FE
REC R
REC L
GND A
+12A
TAPE R
TAPE L
TAPE R
+12A
TAPE L
GND A
REC R
REC L
-CMOS
TAPE R
+12A
TAPE L
GND A
REC R
REC L
1556/1557
6P/7P
MTF (EH)
ECO-MTF (BD FFC)
BD FFC
1110 ESD WIRE(1P)
STOKO PIN 1560
COMBI
# DM 26
RIGHT
GND A
LEFT
# DM 25
+5V
GND
GND
+12M
# 1559
4P
3CDC
LEFT
GND A
RIGHT
+CD
GND D
+12M
SW-INFO
STR-OUTP
SHR-CL
PORE
DATA
SILD
GND
SICL
OE-LATCH
1509
15P
8002
FFC BD
3CDC-MG / 3CDC-RW / 3CDC-99
LEFT
GND A
RIGHT
+CD
GND D
+12M
SW-INFO
STR-OUTP
SHR-CL
PORE
DATA
SILD
GND
SICL
OE-LATCH
1806 ZIF-ST
1551
4P
DM 51
LEFT
GND A
RIGHT
+12A
HEADPHONE
DM 58
1553
6P
DM 56
SPK L
HP L
GND A
HP R
SPK R
GND ESD
SIMPLE KARAOKE
DM 57
&
1552
4P
DM 55
+12A
MIC L
GND A
MIC R
DM 48
MIC IN
GND
STOKO PIN 1562
STOKO PIN 1568
1111 EMC WIRE(1P)
1112 SHIELD WIRE(1P)
TO CDC SHIELD
LOGIC TAPE DECK SHIELD
1222
+A (+)
+A (+)
+C (+)
+C (-)
+A (-)
+A (-)
1252
6P
DM 23
MAINS
1201
A B C D E F G
PRIM
SEC_1
(Wire Type)
TRAFO
SEC_3
SEC_2
STOKO PIN 1569
1251 (ONLY FOR -/37 VER.)
1P
1203
+V (+)
+V (-)
2P (VCD)
1210
GND e
-26V
F1
F2
4P (18W)
# 1555
2P
Zero Insertion Force ZIF
DIPMATE
JST EH MALE
JST PH MALE
JST XH MALE
JST FE MALE

: VCD VERSION FOR FW390V/21

& : FOR VERSIONS WITH SIMPLE KARAOKE

UPDATED : 23/10/98

FRONT BOARD

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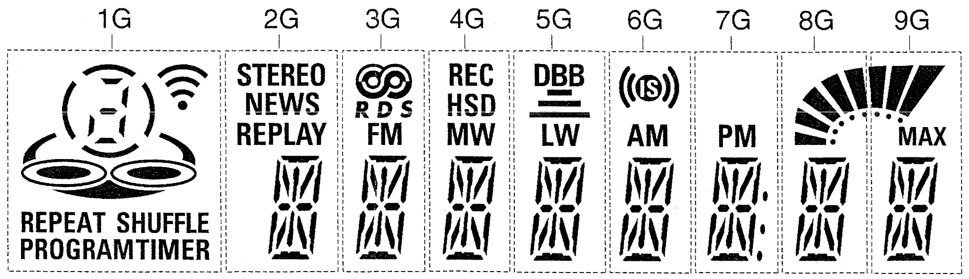
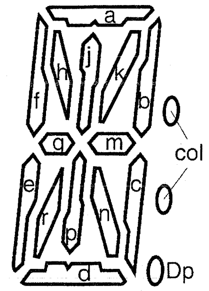
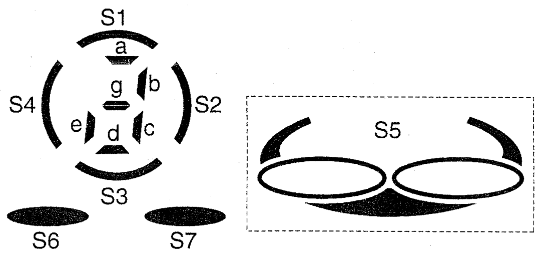
Main part - Component & Chip layout 6-2
Optical part - Circuit & Layouts 6-2
Main part - Circuit diagram 6-3
Electrical parts list 6-4

LCD DISPLAY PIN CONNECTIONS

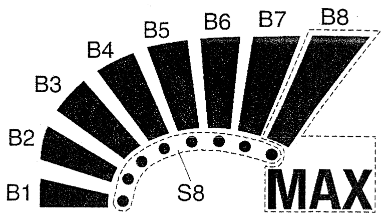




(2G~9G)



(1G)



(8G , 9G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G
P1	S1	a	a	a	a	a	a	a	a
P2	S2	h	h	h	h	h	h	h	h
P3	S3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	k	k	k	k	k	k	k	k
P5	b	b	b	b	b	b	b	b	b
P6	c	f	f	f	f	f	f	f	f
P7	a , d , g	m	m	m	m	m	m	m	m
P8	e	g	g	g	g	g	g	g	g
P9	S5	c	c	c	c	c	c	c	c
P10	S6	e	e	e	e	e	e	e	e
P11	S7	r	r	r	r	r	r	r	r
P12	**SHUFFLE**	n	n	n	n	n	n	n	n
P13	**REPEAT**	d	d	d	d	d	d	d	d
P14	**TIMER**	**STEREO**	**RDS**	**REC**	**DBB**	**TS**	**PM**	S8	
P15	**PROGRAM**	**REPLAY**	**FM**	**HSD**	≡	**(( ))**	col	B5	
P16	📶	**NEWS**	-	**MW**	**LW**	**AM**	Dp	B6	
P17	-	-	-	-	-	-	-	B1	-
P18	-	-	-	-	-	-	-	B2	-
P19	-	-	-	-	-	-	-	B3	-
P20	-	-	-	-	-	-	-	B4	-
P21	-	-	-	-	-	-	-	-	B7
P22	-	-	-	-	-	-	-	-	B8

Front Board application

A51200	FW45C/37, FW320C/21/21M/22/37
A51220	FW55C/37
A51240	FW350C/22/34
A51350	FW380C/21/21M
A51360	FW390C/37, FW398C/30

A51370	FW390C/21/21M, FW398C/21/21M
A51380	FW390C/22/34, FW398C/34
A51390	FW390V/21/21M
A51400	FW65C/37, FW380C/30/37, FW386C/37

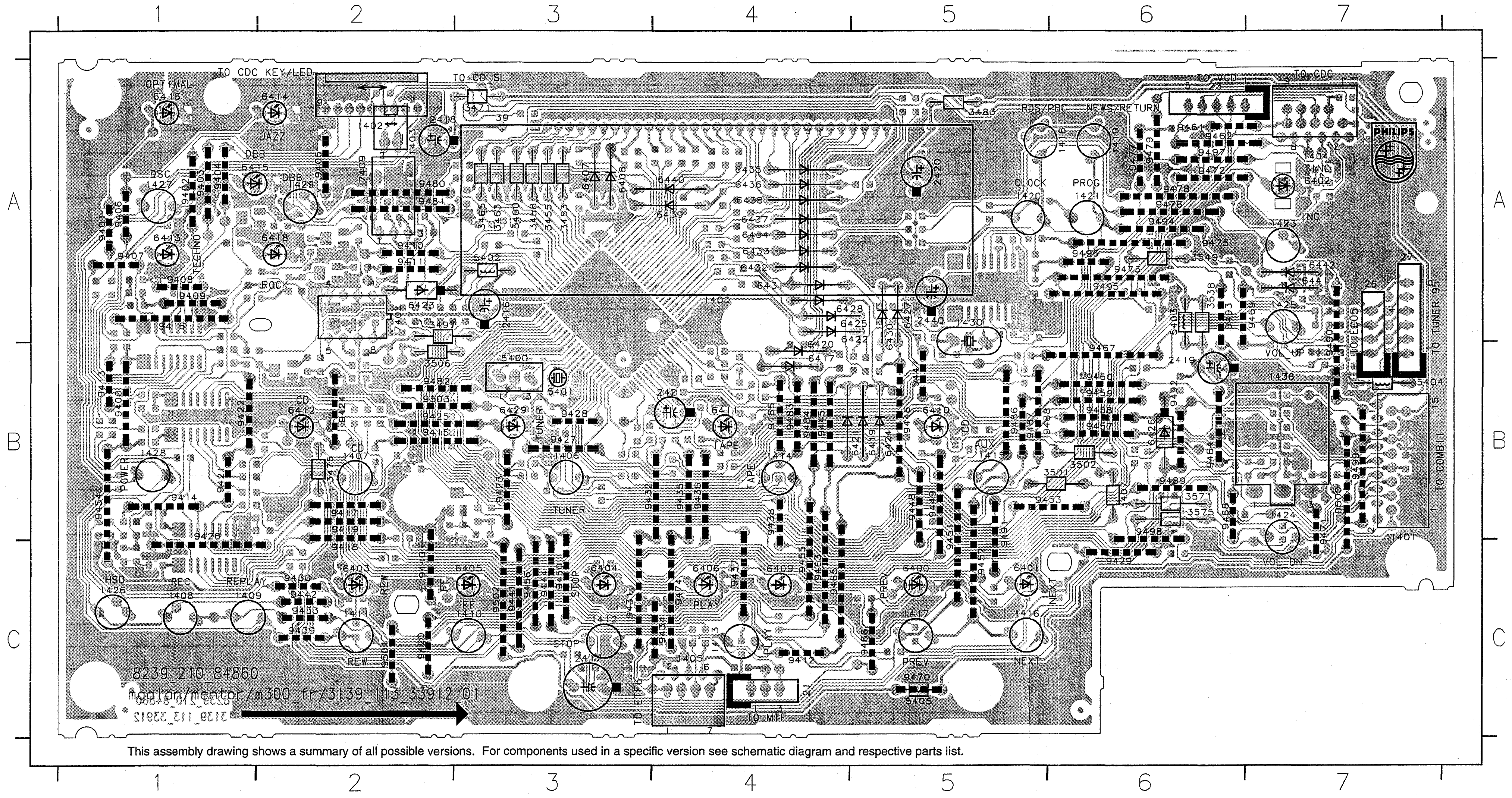
Variations table for Front Board

ITEM NO.	A51200	A51220	A51240	A51350	A51360	A51370	A51380	A51390	A51400	
DM21	x	x	-	x	-	-	-	-	x	
DM23	-	-	-	-	-	-	-	x	-	
DM26	x	x	-	x	x	x	-	x	x	
DM27	-	-	x	-	x	x	x	x	-	
1404	x	x	x	x	x	x	x	-		
1405	-	-	x	-	x	x	x	x	-	
1408	-	-	x	-	x	x	x	x	-	
1409	-	-	x	-	x	x	x	x	-	
1418	-	-	x	-	-	-	x	x	-	
1419	-	-	x	-	-	-	x	x	-	
1423	-	-	-	-	x	x	x	x	-	
1424	x	-	-	-	-	-	-	-	-	
1425	x	-	-	-	-	-	-	-	-	
2417	-	220µF	220µF	220µF	220µF	220µF	220µF	220µF	220µF	
2421	2,2µF	22µF	22µF	22µF	22µF	22µF	22µF	22µF	22µF	
2431	-	100nF	100nF	100nF	100nF	100nF	100nF	100nF	100nF	
2432	-	-	100pF	-	-	-	100pF	-	-	
2433	-	-	47pF	-	-	-	47pF	-	-	
3407	-	-	-	-	1k	1k	1k	1k	-	
3478	1k	1k	1k	1k	1k	1k	1k	-	1k	
3479	100R	100R	100R	100R	100R	100R	100R	-	100R	
3509	1k	1k	1k	1k	1k	1k	1k	-	1k	
3539	10k	10k	-	10k	10k	10k	-	10k	10k	
3541	-	-	1k	-	-	-	1k	-	-	
3546	10k	10k	-	10k	10k	10k	-	10k	10k	
3575	6k8	10k	10k	10k	10k	10k	10k	10k	10k	
3576	47k	10k	10k	10k	10k	10k	10k	10k	10k	
3577	-	-	-	-	12k	12k	12k	12k	12k	
3578	-	-	-	-	5k6	5k6	5k6	5k6	5k6	
3584	-	-	-	-	-	-	-	47k	-	
3585	-	-	-	-	-	-	-	47k	-	
3586	-	-	47k	-	47k	-	47k	47k	-	
3587	-	-	-	-	-	-	-	47k	-	
4400	x	x	-	x	-	-	-	-	x	
4403	x	-	-	-	-	-	-	-	-	
4501	x	x	x	-	-	-	-	-	-	
4540	-	x	x	x	x	x	x	x	x	
4600	-	-	-	-	-	-	-	x	-	
4602	x	-	-	-	-	-	-	-	-	
4603	-	x	x	x	x	x	x	x	x	
5403	-	-	2,2µH	-	-	-	2,2µH	-	-	
6402	-	-	-	-	x	x	x	x	-	
6419	x	x	x	x	-	-	-	-	-	
6421	x	-	-	-	-	-	-	-	-	
6424	-	-	-	x	-	x	-	x	-	
6427	x	x	x	-	-	-	-	-	-	
9491	-	x	x	-	-	-	-	-	-	
FEATURE:										
RDS	-	-	x	-	-	-	x	-	-	
CTRL LIT.	-	-	-	x	x	x	x	x	x	
Rotary Encoder	-	x	x	x	x	x	x	x	x	
Digital Out	-	-	-	-	-	-	-	-	-	

x = Item in use.

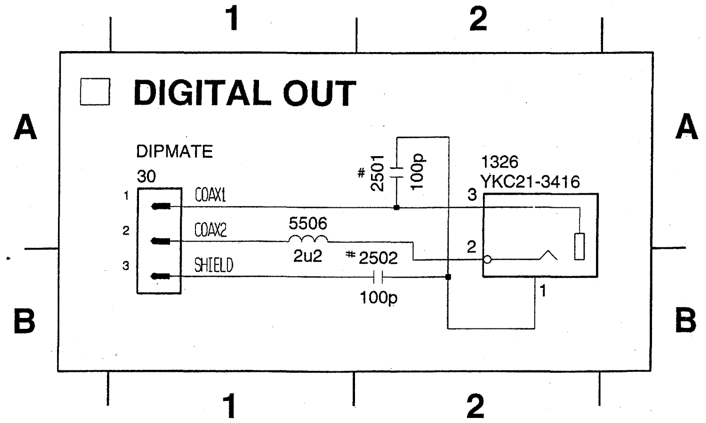
COMPONENT LAYOUT

21	C4	1408	C1	1420	A5	2417	C3	3465	A3	5400	B3	6406	C4	6418	A2	6430	A5	6442	A7	9409	A1	9421	B1	9433	C2	9446	B5	9458	B6	9470	C5	9482	B2	9494	A6
23	A6	1409	C1	1421	A6	2418	A2	3471	A3	5401	B3	6407	A3	6419	B5	6431	A4	7402	A2	9410	A2	9422	B1	9434	C4	9447	B5	9459	B6	9471	B7	9483	B4	9495	A6
26	A7	1410	C3	1423	A7	2419	B6	3475	B2	5402	A3	6408	A3	6420	B4	6432	A4	7409	A2	9411	A2	9423	B3	9435	B4	9448	B5	9460	B6	9472	A6	9484	B4	9496	A6
27	A7	1411	C2	1424	B7	2420	A5	3483	A5	5403	A6	6409	C4	6421	B5	6433	A4	9400	B1	9412	C4	9424	B2	9436	B4	9449	B5	9461	A6	9473	A6	9485	B4	9497	A6
1400	A4	1412	C3	1425	A7	2421	B4	3497	A2	5404	B7	6410	B5	6422	A5	6434	A4	9401	A1	9413	B1	9425	B2	9437	C4	9450	C3	9462	A6	9474	C4	9486	B5	9498	B6
1401	B7	1413	C4	1426	C1	2440	A5	3501	B6	5405	C5	6411	B4	6423	A2	6435	A4	9402	A1	9414	B1	9426	B1	9438	B4	9451	B5	9463	C4	9475	A6	9487	B5	9499	B7
1402	A2	1414	B4	1427	A1	3407	B6	3502	B6	6400	C5	6412	B2	6424	B5	6436	A4	9403	A1	9415	B2	9427	B3	9439	C2	9452	C5	9464	B6	9476	A6	9488	B5	9500	B7
1403	A2	1415	B5	1428	B1	3453	A3	3506	B2	6401	C5	6413	A1	6425	A5	6437	A4	9404	A1	9416	A1	9428	B3	9440	C2	9453	B5	9465	C4	9477	A6	9489	B6	9501	C2
1404	A7	1416	C5	1429	A2	3455	A3	3538	A6	6402	A7	6414	A2	6426	B6	6438	A4	9405	A2	9417	B2	9429	C6	9441	C3	9454	B1	9466	C5	9478	A6	9490	B7	9502	C3
1405	C4	1417	C5	1430	A5	3458	A3	3549	A6	6403	C2	6415	A1	6427	A5	6439	A4	9406	A1	9418	C2	9430	C2	9442	C2	9455	C4	9467	B6	9479	A6	9491	B5	9503	B2
1406	B3	1418	A6	1436	B7	3460	A3	3571	B6	6404	C3	6416	A1	6428	A4	6440	A4	9407	A1	9419	B2	9431	C3	9444	C3	9456	C3	9468	B6	9480	A2	9492	B6		
1407	B2	1419	A6	2416	A3	3463	A3	3575	B6	6405	C3	6417	B4	6429	B3	6441	A7	9408	A1	9420	C2	9432	B3	9445	B4	9457	B6	9469	A7	9481	A2	9493	A6		


1
2
3
4
5
6
7
A
B
C
TO CDC KEY/LED
TO CD SL
TO VCD
TO CDC
RDS/PBC
NEWS/RETURN
PHILIPS
OPTIMAL
JAZZ
DBB
DSC
DBS
TECHNO
ROCK
CLOCK
PROG
TNC
VOL_UP
VOL_DN
TO TUNER 95
TO COMBI
POWER
CD
TUNER
TAPE
AUX
HSO
REC
REPLAY
REW
FF
STOP
PLAY
PREV
NEXT
TO MTF
8239 210 84860
mgalan/mentor/m300_fr/3139_113_33912_01

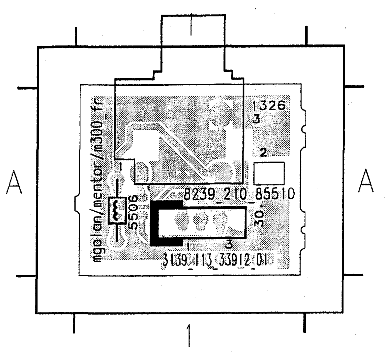
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

DIGITAL OUT - CIRCUIT & LAYOUTS

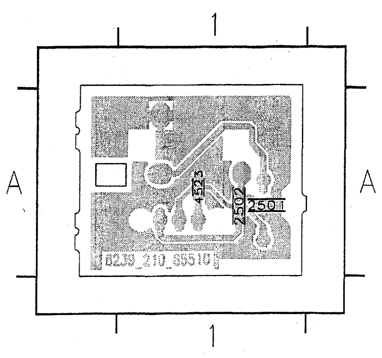

1
2
A
B
DIGITAL OUT
DIPMATE
30
COAX1
COAX2
SHIELD
5506
2u2
2501
100p
2502
100p
1326
YKC21-3416

30	A1
1326	A2
2501	A2
2502	B2
5506	A1

30	A1	1326	A1	5506	A1

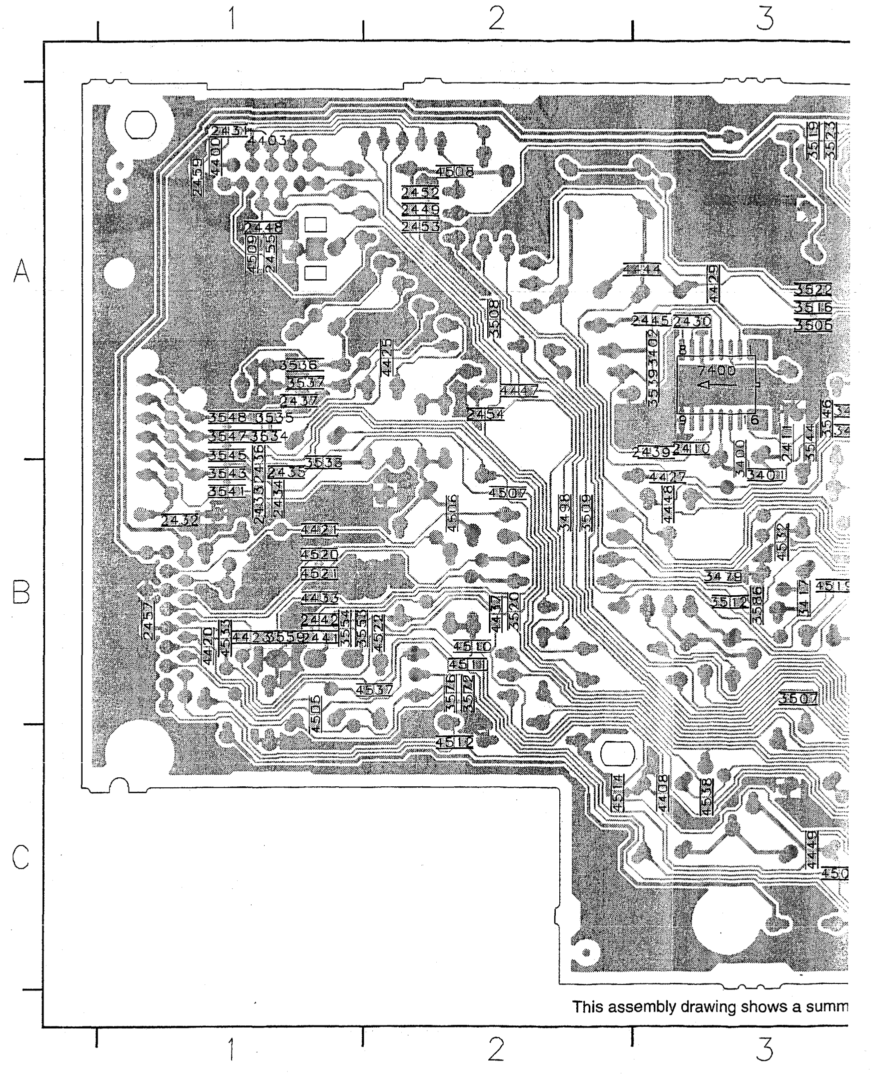

A
1
1326
5506
30
8239_210_85510
3139_113_33912_01
mgalan/mentor/m300_fr

2501	A1	2502	A1	4523	A1


A
1
4523
2502
2501
8239_210_85510

CHIP LAYOUT

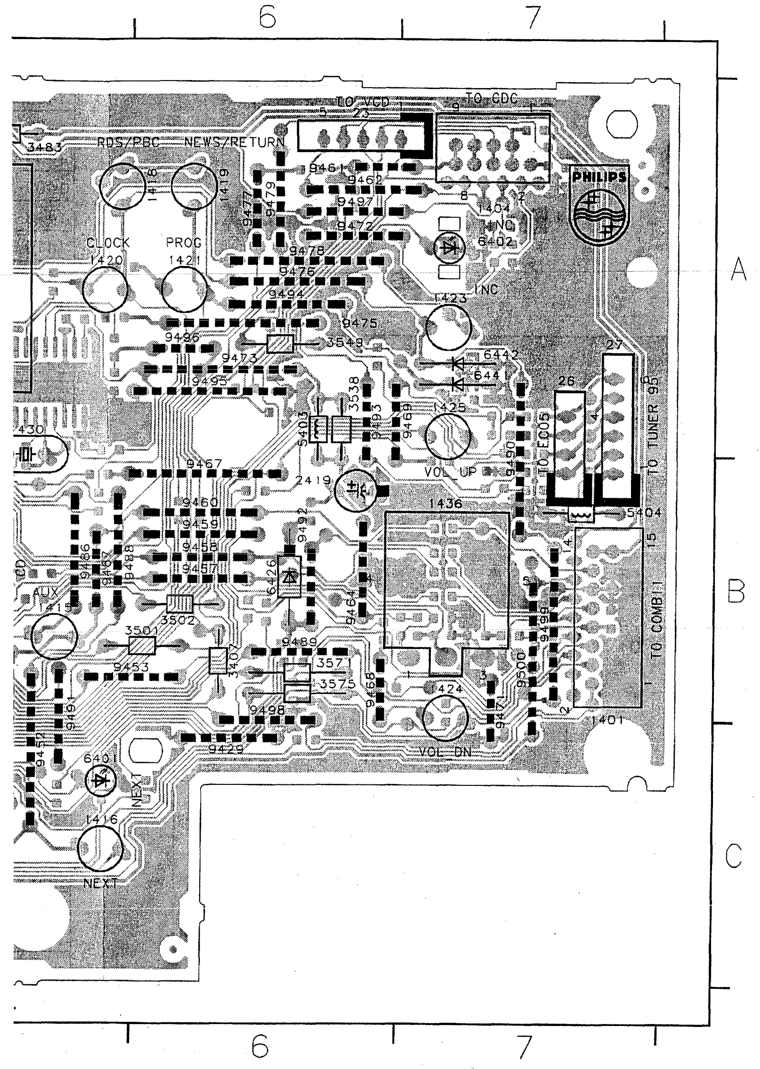
2408	B5	2432	B1	2452	A2	3409	B7	3426	A4	3443	A4	3469	A5	3493	A
2409	B5	2433	B1	2453	A2	3410	A6	3427	A4	3444	A4	3472	A5	3494	A
2410	A3	2434	B1	2454	A2	3411	B7	3428	A4	3445	A4	3474	B3	3495	A
2411	A3	2435	B1	2455	A1	3412	B6	3429	A4	3446	A4	3476	A5	3496	A
2412	C7	2436	B1	2456	C7	3413	C5	3430	A4	3447	B4	3477	B4	3498	B
2414	A6	2437	A1	2457	B1	3414	B6	3431	B4	3448	A7	3478	A5	3499	B
2415	B4	2439	A3	2458	B7	3415	B6	3433	B6	3449	A7	3479	B3	3500	B
2422	B5	2441	B1	2459	A1	3416	B6	3434	A5	3451	A7	3480	B3	3503	A
2423	B5	2442	B1	2460	C3	3417	B3	3435	A5	3452	A7	3481	A6	3504	B
2424	B5	2443	B5	3400	B3	3419	B4	3436	A5	3454	B4	3482	B4	3505	A
2425	B6	2444	B7	3401	B3	3420	A5	3437	A4	3456	B4	3484	A6	3507	B
2426	A6	2445	A3	3402	A3	3421	A4	3438	A4	3457	A7	3485	B4	3508	A
2427	A6	2448	A1	3403	B6	3422	A4	3439	A4	3459	B4	3486	A6	3509	B
2428	B6	2449	A2	3405	B6	3423	A4	3440	A4	3462	B4	3488	A3	3510	B
2430	A3	2450	A7	3406	A6	3424	A4	3441	A4	3464	B4	3489	A5	3511	B
2431	A1	2451	B7	3408	B7	3425	A4	3442	A4	3467	B3	3490	B5	3512	B


1
2
3
A
B
C
7400

This assembly drawing shows a summ

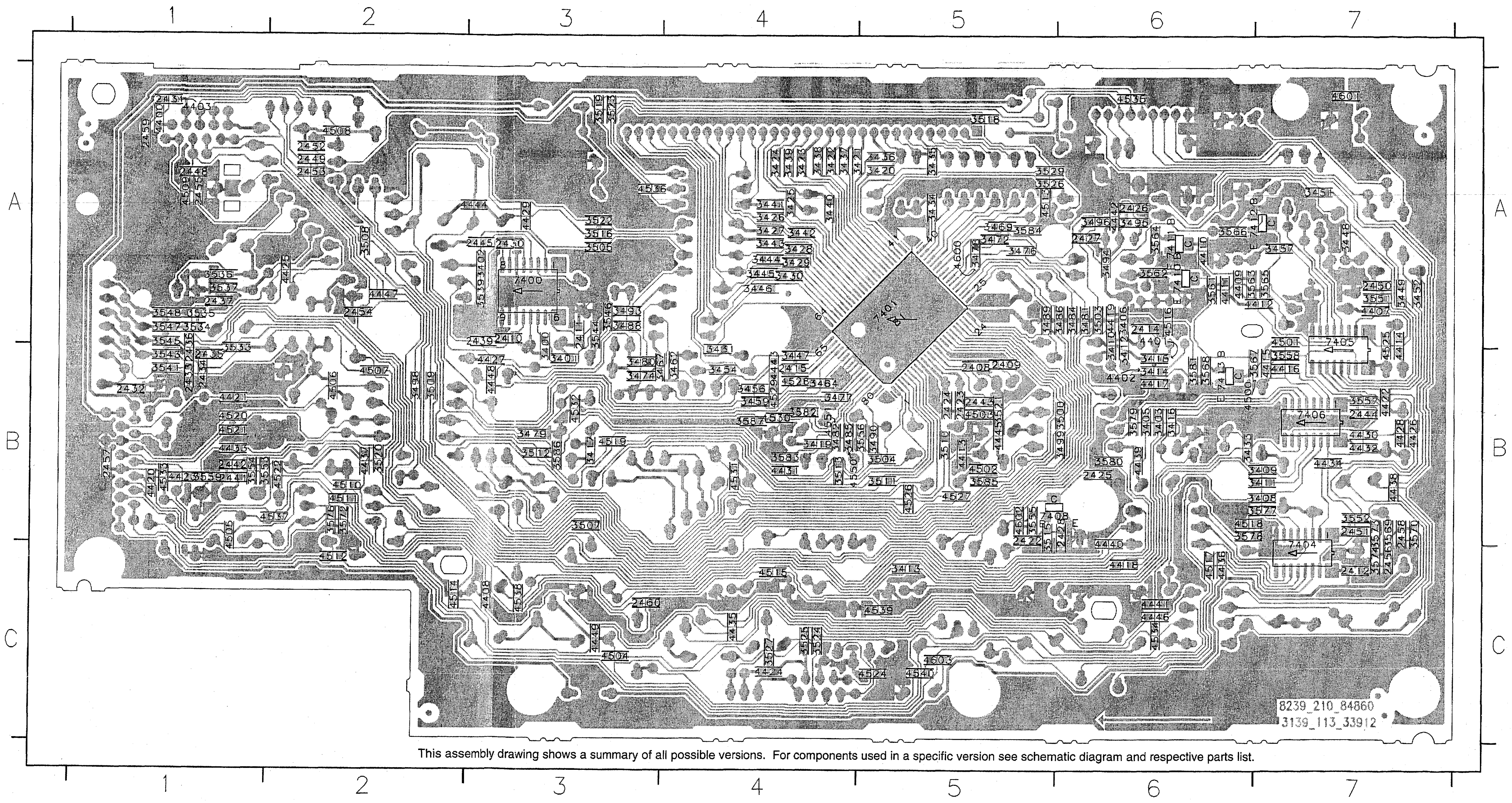
CHIP LAYOUT

9433	C2	9446	B5	9458	B6	9470	C5	9482	B2	9494	A6
9434	C4	9447	B5	9459	B6	9471	B7	9483	B4	9495	A6
9435	B4	9448	B5	9460	B6	9472	A6	9484	B4	9496	A6
9436	B4	9449	B5	9461	A6	9473	A6	9485	B4	9497	A6
9437	C4	9450	C3	9462	A6	9474	C4	9486	B5	9498	B6
9438	B4	9451	B5	9463	C4	9475	A6	9487	B5	9499	B7
9439	C2	9452	C5	9464	B6	9476	A6	9488	B5	9500	B7
9440	C2	9453	B5	9465	C4	9477	A6	9489	B6	9501	C2
9441	C3	9454	B1	9466	C5	9478	A6	9490	B7	9502	C3
9442	C2	9455	C4	9467	B6	9479	A6	9491	B5	9503	B2
9444	C3	9456	C3	9468	B6	9480	A2	9492	B6		
9445	B4	9457	B6	9469	A7	9481	A2	9493	A6		

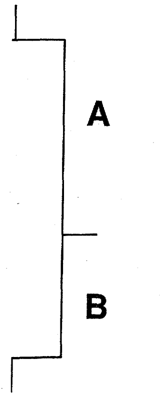


2408	B5	2432	B1	2452	A2	3409	B7	3426	A4	3443	A4	3469	A5	3493	A3	3513	B4	3535	A1
2409	B5	2433	B1	2453	A2	3410	A6	3427	A4	3444	A4	3472	A5	3494	A6	3515	B5	3536	A1
2410	A3	2434	B1	2454	A2	3411	B7	3428	A4	3445	A4	3474	B3	3495	A6	3516	A3	3537	A1
2411	A3	2435	B1	2455	A1	3412	B6	3429	A4	3446	A4	3476	A5	3496	A6	3518	A5	3539	A3
2412	C7	2436	B1	2456	C7	3413	C5	3430	A4	3447	B4	3477	B4	3498	B2	3519	A3	3541	B1
2414	A6	2437	A1	2457	B1	3414	B6	3431	B4	3448	A7	3478	A5	3499	B6	3520	B2	3543	B1
2415	B4	2439	A3	2458	B7	3415	B6	3433	B6	3449	A7	3479	B3	3500	B6	3521	B5	3544	A3
2422	B5	2441	B1	2459	A1	3416	B6	3434	A5	3451	A7	3480	B3	3503	A6	3522	A3	3545	A1
2423	B5	2442	B1	2460	C3	3417	B3	3435	A5	3452	A7	3481	A6	3504	B5	3523	A3	3546	A3
2424	B5	2443	B5	3400	B3	3419	B4	3436	A5	3454	B4	3482	B4	3505	A3	3524	C4	3547	A1
2425	B6	2444	B7	3401	B3	3420	A5	3437	A4	3456	B4	3484	A6	3507	B3	3525	C4	3548	A1
2426	A6	2445	A3	3402	A3	3421	A4	3438	A4	3457	A7	3485	B4	3508	A2	3526	A5	3551	A7
2427	A6	2448	A1	3403	B6	3422	A4	3439	A4	3459	B4	3486	A6	3509	B2	3527	C4	3552	B7
2428	B6	2449	A2	3405	B6	3423	A4	3440	A4	3462	B4	3488	A3	3510	B5	3529	A5	3553	B1
2430	A3	2450	A7	3406	A6	3424	A4	3441	A4	3464	B4	3489	A5	3511	B5	3533	B1	3554	B1
2431	A1	2451	B7	3408	B7	3425	A4	3442	A4	3467	B3	3490	B5	3512	B3	3534	A1	3555	B5

3556	B5	3574	C7	4403	A1	4422	B7	4438	B7	4504	C3	4520	B1	4537	B2	7410	A6
3557	B7	3576	B2	4407	A7	4423	B1	4439	B6	4505	B1	4521	B1	4538	C3	7411	A6
3558	B7	3577	B7	4408	C3	4424	C4	4440	B6	4506	B2	4522	B2	4539	C5	7412	A6
3559	B1	3578	B6	4409	A6	4425	A2	4441	C6	4507	B2	4524	C5	4540	C5	7413	B6
3561	A6	3579	B6	4410	A6	4426	B7	4442	A6	4508	A2	4525	A7	4550	B4		
3562	A6	3580	B6	4411	A6	4427	B3	4443	B4	4509	A1	4526	B5	4551	B4		
3563	A6	3581	B6	4412	A7	4428	B7	4444	A3	4510	B2	4527	B5	4600	A5		
3564	A6	3582	B4	4413	B5	4429	A3	4445	B5	4511	B2	4528	B4	4601	A7		
3565	A7	3583	B4	4414	A7	4430	B7	4446	C6	4512	C2	4529	B4	4602	B5		
3566	A6	3584	A5	4415	B7	4431	B4	4447	A2	4513	A5	4530	B4	4603	C5		
3567	B7	3585	B5	4416	B7	4432	B7	4448	B3	4514	C2	4531	B4	7400	A3		
3568	B6	3586	B3	4417	B6	4433	B1	4449	C3	4515	C4	4532	B3	7401	A5		
3569	B7	3587	B4	4418	C6	4434	B7	4500	B6	4516	A6	4533	B1	7404	B7		
3570	B7	4400	A1	4419	A6	4435	C4	4501	A7	4517	C6	4534	C6	7405	A7		
3572	B2	4401	A6	4420	B1	4436	C6	4502	B5	4518	B6	4535	A6	7406	B7		
3573	B7	4402	B6	4421	B1	4437	B2	4503	B5	4519	B3	4536	A3	7408	B5		

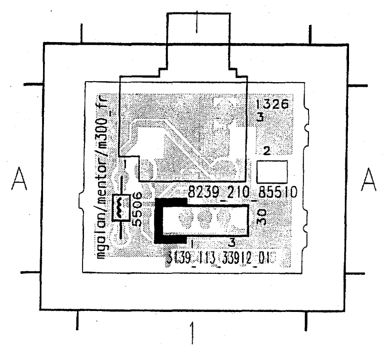


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

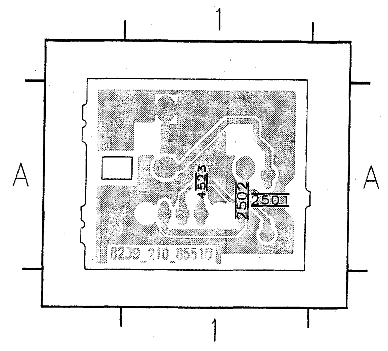


30 A1
1326 A2
2501 A2
2502 B2
5506 A1

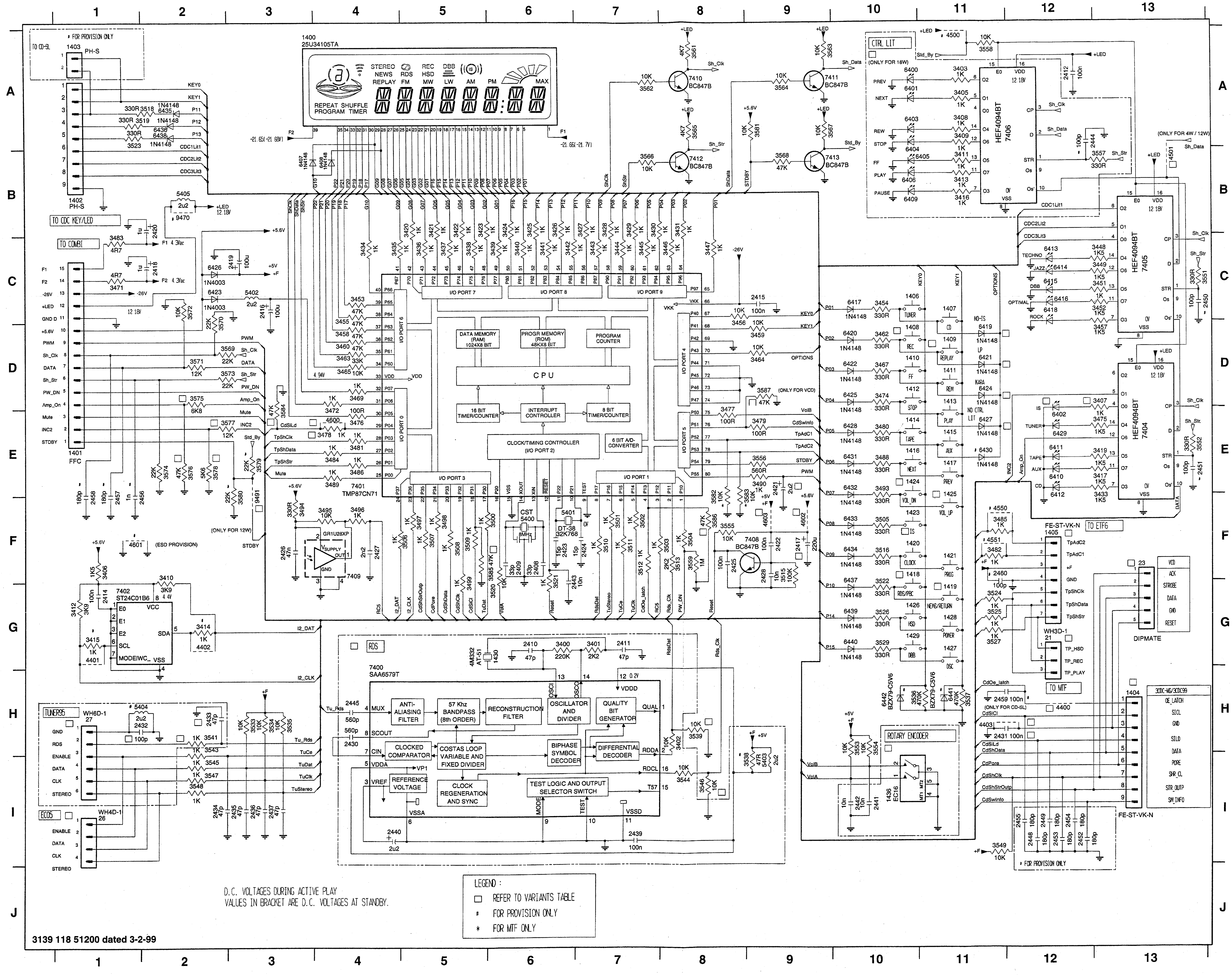
30 A1 1326 A1 5506 A1



2501 A1 2502 A1 4523 A1



CIRCUIT DIAGRAM


1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I J
1400
25U3410STA
STEREO NEWS REPLAY RDS FM REC HSD MW DBB LW AM PM MAX
REPEAT SHUFFLE PROGRAM TIMER
7401
TMP87CN71
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
I/O PORT 0
I/O PORT 1
I/O PORT 3
I/O PORT 4
I/O PORT 5
I/O PORT 6
I/O PORT 7
I/O PORT 8
I/O PORT 9
7400
SAA6579T
RDS
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
7402
ST24C01B6
7409
GP1U28XP
7410 BC847B
7411 BC847B
7412 BC847B
7413 BC847B
7408 BC847B
7406 HEF4094BT
7405 HEF4094BT
7404 HEF4094BT
CTRL LIT
(ONLY FOR 18W)
(ONLY FOR 4W / 12W)
PREV NEXT REW STOP FF PLAY PAUSE
TECHNO JAZZ DBB OPTIMAL ROCK
IS TUNER TAPE AUX CD
TUNER CD REC REPLAY FF REW STOP PLAY TAPE AUX NEXT PREV VOL_DN VOL_UP IS CLOCK PROG RDS/PBC NEWS/RETURN HSD POWER DBB OSC
ROTARY ENCODER
1401 FFC
1402 PH-S
1403 PH-S
# FOR PROVISION ONLY
TO CD-SL
TO CDC KEY/LED
TO COMBI
TUNER95 WH6D-1
EC05 WH4D-1
FE-ST-VK-N
TO ETF6
WH3D-1
TO MTF
DIPMATE
CDC-MG/CDC99
(ONLY FOR CD-SL)
(ESD PROVISION)
(ONLY FOR 12W)
(ONLY FOR VCD)
# FOR PROVISION ONLY

D.C. VOLTAGES DURING ACTIVE PLAY
VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY.

LEGEND :
☐ REFER TO VARIANTS TABLE
FOR PROVISION ONLY
* FOR MTF ONLY

3139 118 51200 dated 3-2-99

21	G12
23	F13
26	I1
27	H1
1400	A3
1401	E1
1402	B1
1403	A1
1404	H13
1405	F12
1406	C10
1407	C11
1408	D10
1409	D11
1410	D10
1411	D11
1412	D10
1413	D11
1414	E10
1415	E11
1416	E10
1417	E11
1418	F10
1419	G11
1420	F10
1421	F11
1423	F10
1424	E10
1425	F11
1426	G10
1427	G11
1428	G11
1429	G10
1430	G6
1436	I10
2408	F6
2409	F6
2410	G6
2411	G7
2412	A12
2414	G1
2415	C9
2416	C3
2417	F9
2418	C2
2419	C3
2420	B2
2421	E9
2422	F9
2423	F6
2424	F7
2425	F8
2426	F3
2427	F4
2428	F9
2430	H4
2431	H11
2432	H1
2433	H2
2434	I2
2435	I3
2436	I3
2437	I3
2439	I7
2440	I4
2441	I10
2442	I10
2443	G6
2444	A12
2445	H4
2448	I12
2449	I12
2450	C13
2451	E13
2452	I12
2453	I12
2454	I12
2455	I12
2456	F1
2457	F1
2458	F1
2459	H11
2460	F11
3400	G6
3401	G7
3402	H8
3403	A11
3405	A11
3406	F1
3407	D13
3408	A11
3409	A11
3410	F2
3411	B11
3412	G1
3413	B11
3414	G2
3415	G1
3416	B11
3417	E13
3419	E13
3420	B5
3421	B5
3422	B5
3423	B5
3424	B6
3425	B6
3426	B6
3427	B7
3428	B7
3429	B7
3430	B7
3431	B8
3433	F13
3434	C4
3435	C4
3436	C5
3437	C5
3438	C5
3439	C6
3440	C6
3441	C6
3442	C6
3443	C7
3444	C7
3445	C7
3446	C8
3447	C8
3448	C13
3449	C13
3451	C13
3452	C13
3453	C4
3454	C10
3455	D4
3456	C8
3457	D13
3458	D4
3459	D9
3460	D4
3462	D10
3463	D4
3464	D9
3465	D4
3467	D10
3469	D4
3471	C1
3472	D4
3474	D10
3475	E13
3476	E4
3477	E8
3478	E4
3479	E9
3480	E10
3481	E4
3482	F11
3483	C1
3484	E4
3485	F11
3486	E4
3488	E10
3489	E4
3490	E9
3493	E10
3494	F3
3495	F4
3496	F4
3497	F5
3498	F5
3499	G5
3500	F6
3501	F7
3502	F7
3503	F8
3504	F8
3505	F10
3506	F5
3507	F5
3508	F5
3509	F5
3510	F7
3511	F7
3512	F7
3513	F8
3515	F9
3516	F10
3518	A2
3519	A2
3520	G6
3521	F6
3522	G10
3523	A1
3524	G11
3525	G11
3526	G10
3527	G11
3529	G10
3533	H3
3534	H3
3535	H3
3536	H10
3537	H11
3538	I9
3539	H8
3541	H2
3543	H2
3544	I8
3545	I2
3546	I8
3547	I2
3548	I2
3549	I11
3551	C13
3552	E13
3553	H10
3554	H10
3555	F8
3556	E9
3557	B13
3558	A11
3559	F8
3561	A8
3562	A7
3563	A9
3564	A9
3565	A8
3566	B7
3567	A9
3568	B9
3569	D2
3570	D2
3571	D2
3572	C2
3573	D2
3574	E2
3575	D2
3576	E2
3577	E2
3578	E2
3579	E3
3580	F3
3581	A9
3582	F8
3583	F9
3584	E3
3585	F6
3586	F8
3587	D9
4400	H12
4401	G1
4402	G2
4403	H11
4500	A11
4501	B13
4550	F11
4551	F11
4600	E4
4601	F1
4602	F9
4603	F9
5400	F6
5401	F6
5402	C3
5403	I9
5404	H1
5405	B2
6400	A10
6401	A10
6402	E12
6403	A10
6404	B10
6405	B11
6406	B10
6407	B3
6408	B4
6409	B10
6410	E12
6411	E12
6412	F12
6413	C12
6414	C12
6415	C12
6416	C12
6417	C10
6418	C12
6419	D11
6420	D10
6421	D11
6422	D10
6423	C2
6424	D11
6425	D10
6426	C2
6427	E11
6428	E10
6429	E12
6430	E11
6431	E10
6432	E10
6433	F10
6434	F10
6435	A2
6436	A2
6437	G10
6438	A2
6439	G10
6440	G10
6441	H11
6442	H10
7400	H4
7401	E4
7402	G1
7404	E13
7405	C13
7406	A11
7408	F9
7409	F4
7410	A8
7411	A9
7412	B8
7413	B9
9470	B2
9491	F3

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00171	FTD Display
1401	4822 265 10979	Flex Socket 15pin Hort.
1404	4822 265 11531	Flex Socket 9pin Hort.
1405	4822 267 10956	Flex Socket 7pin Hort.
1406	4822 276 13775	Tact Switch
1407	4822 276 13775	Tact Switch
1408	4822 276 13775	Tact Switch
1409	4822 276 13775	Tact Switch
1410	4822 276 13775	Tact Switch
1411	4822 276 13775	Tact Switch
1412	4822 276 13775	Tact Switch
1413	4822 276 13775	Tact Switch
1414	4822 276 13775	Tact Switch
1415	4822 276 13775	Tact Switch
1416	4822 276 13775	Tact Switch
1417	4822 276 13775	Tact Switch
1418	4822 276 13775	Tact Switch
1419	4822 276 13775	Tact Switch
1420	4822 276 13775	Tact Switch
1421	4822 276 13775	Tact Switch
1426	4822 276 13775	Tact Switch
1427	4822 276 13775	Tact Switch
1428	4822 276 13775	Tact Switch
1429	4822 276 13775	Tact Switch
1430	4822 242 72195	Quartz 4,332MHz
1436	4822 273 10365	Rotary Encoder 24p

CAPACITORS

2408	5322 122 32659	33pF 5% 50V
2409	5322 122 32659	33pF 5% 50V
2410	4822 126 13692	47pF 1% 63V
2411	4822 126 13692	47pF 1% 63V
2412	4822 126 14118	100nF +80/-20% 50V
2414	4822 126 14118	100nF +80/-20% 50V
2415	4822 126 14118	100nF +80/-20% 50V
2416	4822 124 23432	100µF 20% 10V
2417	4822 124 12245	220µF 20% 10V
2418	4822 124 40242	1µF 20% 63V
2419	4822 124 41584	100µF 20% 10V
2420	4822 124 22651	1,0µF 20% 50V
2421	4822 124 41796	22µF 20% 16V
2422	4822 126 14118	100nF +80/-20% 50V
2423	4822 126 13486	15pF 2% 63V
2424	4822 126 13486	15pF 2% 63V
2425	4822 126 14118	100nF +80/-20% 50V
2426	4822 126 13751	47nF 10% 63V
2427	4822 122 33175	2,2nF 20% 50V
2428	4822 122 33177	10nF 20% 50V
2430	5322 116 80853	560pF 5% 63V
2431	4822 126 13196	100nF 10% 25V
2432	5322 122 32531	100pF 5% 50V
2433	4822 126 13692	47pF 1% 63V
2434	4822 126 13692	47pF 1% 63V
2435	4822 126 13692	47pF 1% 63V
2436	4822 126 13692	47pF 1% 63V
2437	4822 126 13692	47pF 1% 63V
2439	4822 126 13196	100nF 10% 25V
2440	4822 124 22652	2,2µF 20% 50V
2441	4822 122 33177	10nF 20% 50V
2442	4822 122 33177	10nF 20% 50V
2443	4822 122 33177	10nF 20% 50V
2445	5322 116 80853	560pF 5% 63V

RESISTORS

3400	4822 117 13579	220k 1% 0,1W
3401	4822 117 11449	2k2 1% 0,1W
3402	4822 117 10833	10k 1% 0,1W
3406	4822 117 11139	1k5 1% 0,1W
3410	4822 051 20392	3k9 5% 0,1W
3412	4822 051 20392	3k9 5% 0,1W
3417	4822 117 11139	1k5 1% 0,1W
3419	4822 117 11139	1k5 1% 0,1W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 051 10102	1k 2% 0,25W
3431	4822 051 10102	1k 2% 0,25W
3433	4822 117 11139	1k5 1% 0,1W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 117 11139	1k5 1% 0,1W
3449	4822 117 11139	1k5 1% 0,1W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 117 11139	1k5 1% 0,1W
3453	4822 116 83884	47k 5% 0,5W
3454	4822 051 20331	330R 5% 0,1W
3455	4822 116 83884	47k 5% 0,5W
3456	4822 117 10833	10k 1% 0,1W
3457	4822 117 11139	1k5 1% 0,1W
3458	4822 116 83884	47k 5% 0,5W
3459	4822 117 10833	10k 1% 0,1W
3460	4822 116 83884	47k 5% 0,5W
3462	4822 051 20331	330R 5% 0,1W
3463	4822 116 52271	33k 5% 0,5W
3464	4822 117 10833	10k 1% 0,1W
3465	4822 116 83864	10k 5% 0,5W
3467	4822 051 20331	330R 5% 0,1W
3469	4822 051 10102	1k 2% 0,25W
3471	4822 050 24708	4R7 1% 0,6W
3472	4822 051 10102	1k 2% 0,25W
3474	4822 051 20331	330R 5% 0,1W
3475	4822 116 52243	1k5 5% 0,5W
3476	4822 051 20101	100R 5% 0,1W
3477	4822 051 20101	100R 5% 0,1W
3478	4822 051 10102	1k 2% 0,25W
3479	4822 051 20101	100R 5% 0,1W
3480	4822 051 20331	330R 5% 0,1W
3481	4822 051 10102	1k 2% 0,25W
3482	4822 051 10102	1k 2% 0,25W
3483	4822 050 24708	4R7 1% 0,6W
3484	4822 051 10102	1k 2% 0,25W
3485	4822 051 10102	1k 2% 0,25W
3486	4822 051 10102	1k 2% 0,25W
3488	4822 051 20331	330R 5% 0,1W
3489	4822 051 10102	1k 2% 0,25W
3490	4822 051 10102	1k 2% 0,25W
3493	4822 051 20331	330R 5% 0,1W
3494	4822 051 20331	330R 5% 0,1W
3495	4822 117 10833	10k 1% 0,1W
3496	4822 051 10102	1k 2% 0,25W
3497	4822 050 11002	1k 1% 0,4W
3498	4822 051 10102	1k 2% 0,25W
3499	4822 051 10102	1k 2% 0,25W
3500	4822 051 10102	1k 2% 0,25W
3501	4822 050 11002	1k 1% 0,4W
3502	4822 050 11002	1k 1% 0,4W
3503	4822 051 10102	1k 2% 0,25W
3504	4822 051 10102	1k 2% 0,25W
3505	4822 051 20331	330R 5% 0,1W
3506	4822 050 11002	1k 1% 0,4W
3507	4822 051 10102	1k 2% 0,25W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 051 10102	1k 2% 0,25W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 10102	1k 2% 0,25W
3513	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20104	100k 5% 0,1W
3516	4822 051 20331	330R 5% 0,1W
3518	4822 051 20331	330R 5% 0,1W
3519	4822 051 20331	330R 5% 0,1W
3520	4822 117 10833	10k 1% 0,1W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 051 20331	330R 5% 0,1W
3523	4822 051 20331	330R 5% 0,1W
3524	4822 051 10102	1k 2% 0,25W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 20331	330R 5% 0,1W
3527	4822 051 10102	1k 2% 0,25W
3529	4822 051 20331	330R 5% 0,1W
3533	4822 117 10833	10k 1% 0,1W
3534	4822 117 10833	10k 1% 0,1W
3535	4822 117 10833	10k 1% 0,1W
3536	4822 051 20474	470k 5% 0,1W
3537	4822 051 20474	470k 5% 0,1W
3541	4822 051 10102	1k 2% 0,25W
3543	4822 051 10102	1k 2% 0,25W
3544	4822 117 10833	10k 1% 0,1W
3545	4822 051 10102	1k 2% 0,25W
3547	4822 051 10102	1k 2% 0,25W
3548	4822 051 10102	1k 2% 0,25W
3549	4822 116 83864	10k 5% 0,5W
3551	4822 051 20331	330R 5% 0,1W
3552	4822 051 20331	330R 5% 0,1W
3553	4822 117 10833	10k 1% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3555	4822 117 10833	10k 1% 0,1W
3556	4822 051 20561	560R 5% 0,1W
3558	4822 117 10833	10k 1% 0,1W
3559	4822 051 20105	1M 5% 0,1W
3561	4822 051 20472	4k7 5% 0,1W
3562	4822 117 10833	10k 1% 0,1W
3563	4822 117 10833	10k 1% 0,1W
3564	4822 117 10833	10k 1% 0,1W
3565	4822 051 20472	4k7 5% 0,1W
3566	4822 117 10833	10k 1% 0,1W
3567	4822 117 10833	10k 1% 0,1W
3568	4822 117 10834	47k 1% 0,1W
3569	4822 051 20223	22k 5% 0,1W
3570	4822 051 20223	22k 5% 0,1W
3571	4822 116 52238	12k 5% 0,5W
3572	4822 117 10833	10k 1% 0,1W
3573	4822 051 20223	22k 5% 0,1W
3574	4822 051 20223	22k 5% 0,1W
3575	4822 116 83864	10k 5% 0,5W
3576	4822 116 83864	10k 5% 0,5W
3581	4822 117 10833	10k 1% 0,1W
3586	4822 117 10834	47k 1% 0,1W
4401	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

4402	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4409	4822 051 20008	0R Jumper 0805
4410	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4415	4822 051 20008	0R Jumper 0805
4416	4822 051 20008	0R Jumper 0805
4417	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4422	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4504	4822 051 20008	0R Jumper 0805
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 242 72066	Ceram Resonator 8MHz
5401	4822 242 70938	X'tal Resonator 32,768kHz
5402	4822 157 11477	Coil 2,2µH 5%
5403	4822 157 11477	Coil 2,2µH 5%
5405	4822 157 11477	Coil 2,2µH 5%

DIODES

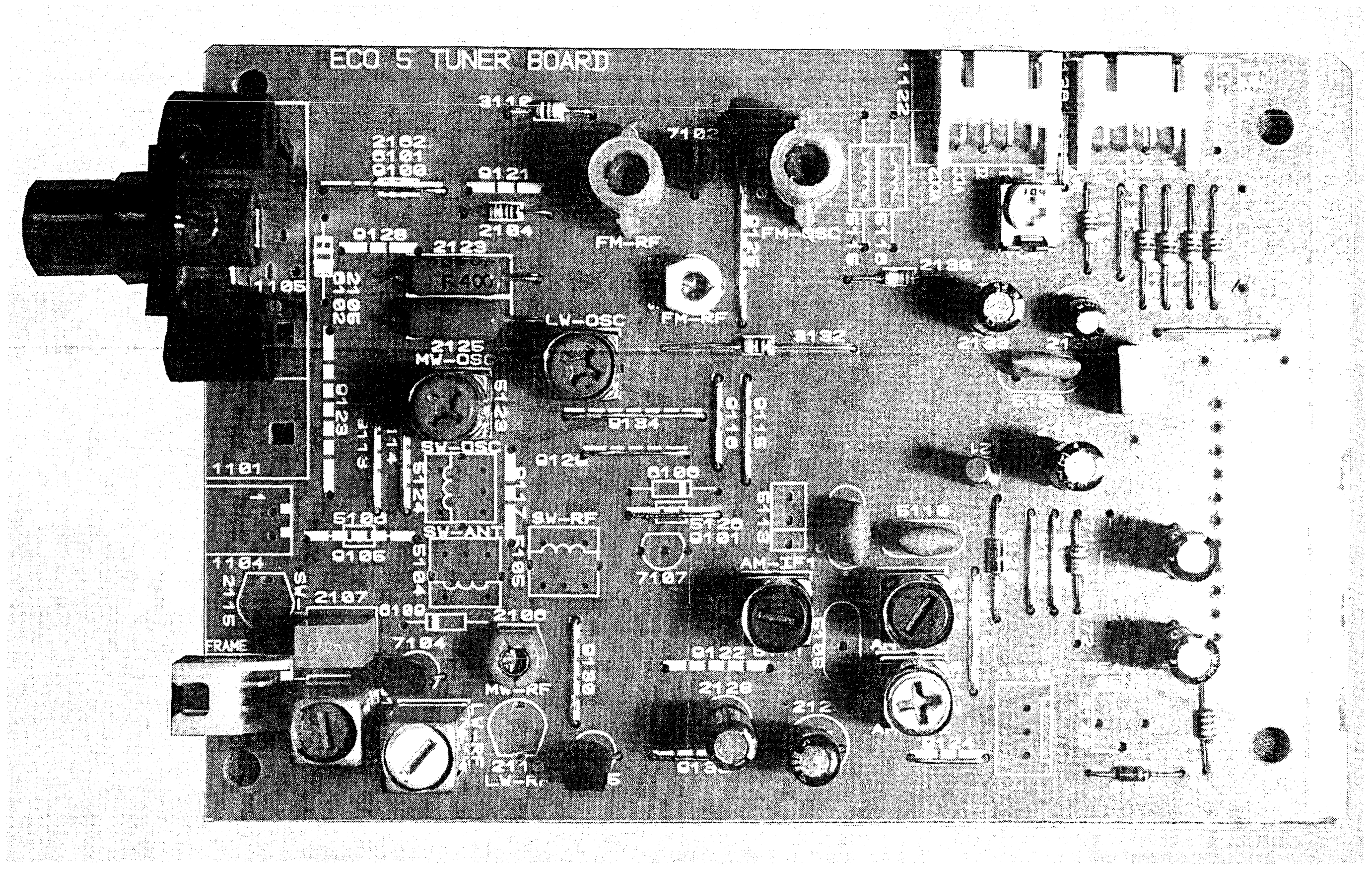
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6410	4822 130 10792	LTL-1CHPE
6411	4822 130 10792	LTL-1CHPE
6412	4822 130 10792	LTL-1CHPE
6413	4822 130 10792	LTL-1CHPE
6414	4822 130 10792	LTL-1CHPE
6415	4822 130 10791	LTL-1CHGE
6416	4822 130 10792	LTL-1CHPE
6417	4822 130 30621	1N4148
6418	4822 130 10792	LTL-1CHPE
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6422	4822 130 30621	1N4148

ELECTRICAL PARTS LIST - FRONT BOARD

DIODES		
6423	4822 130 31878	1N4003G
6425	4822 130 30621	1N4148
6426	4822 130 31878	1N4003G
6427	4822 130 30621	1N4148
6428	4822 130 30621	1N4148
6429	4822 130 10792	LTL-1CHPE
6431	4822 130 30621	1N4148
6432	4822 130 30621	1N4148
6433	4822 130 30621	1N4148
6434	4822 130 30621	1N4148
6435	4822 130 30621	1N4148
6436	4822 130 30621	1N4148
6437	4822 130 30621	1N4148
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS		
7400	4822 209 31981	SAA6579T
7401	4822 209 17403	TMP87CS71F "350S51811"
7402	4822 209 31508	ST24C01B1
7404	5322 209 11306	HEF4094BT
7405	5322 209 11306	HEF4094BT
7408	4822 130 60511	BC847B
7409	4822 130 10165	GP1U28XP
7410	4822 130 60511	BC847B
7411	4822 130 60511	BC847B
7412	4822 130 60511	BC847B
7413	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.


ECO 5 TUNER BOARD
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
AM-IF1
MW-RF
LW-RF
FRAME

TUNER BOARD ECO5

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Circuit diagram 7B-3
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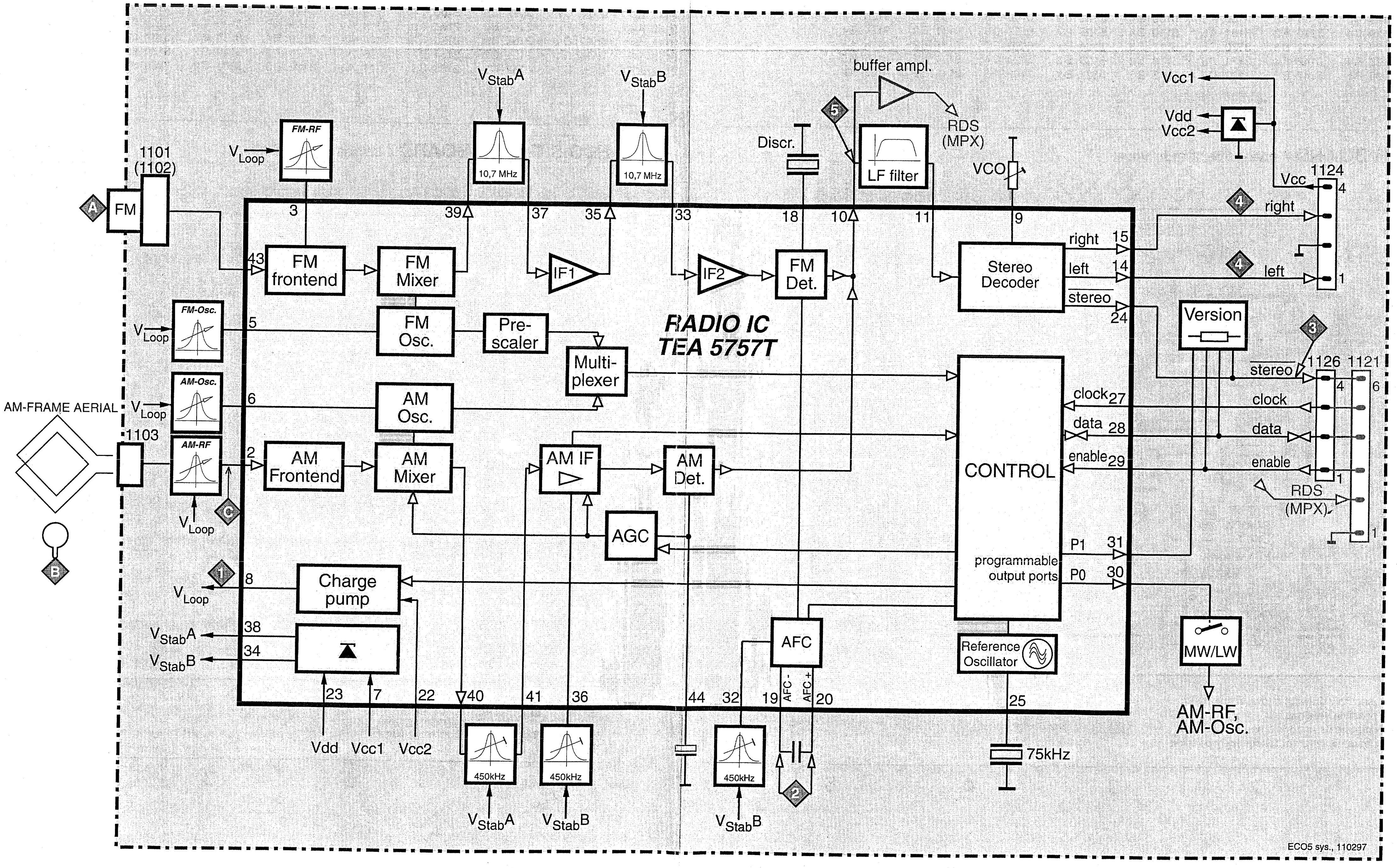
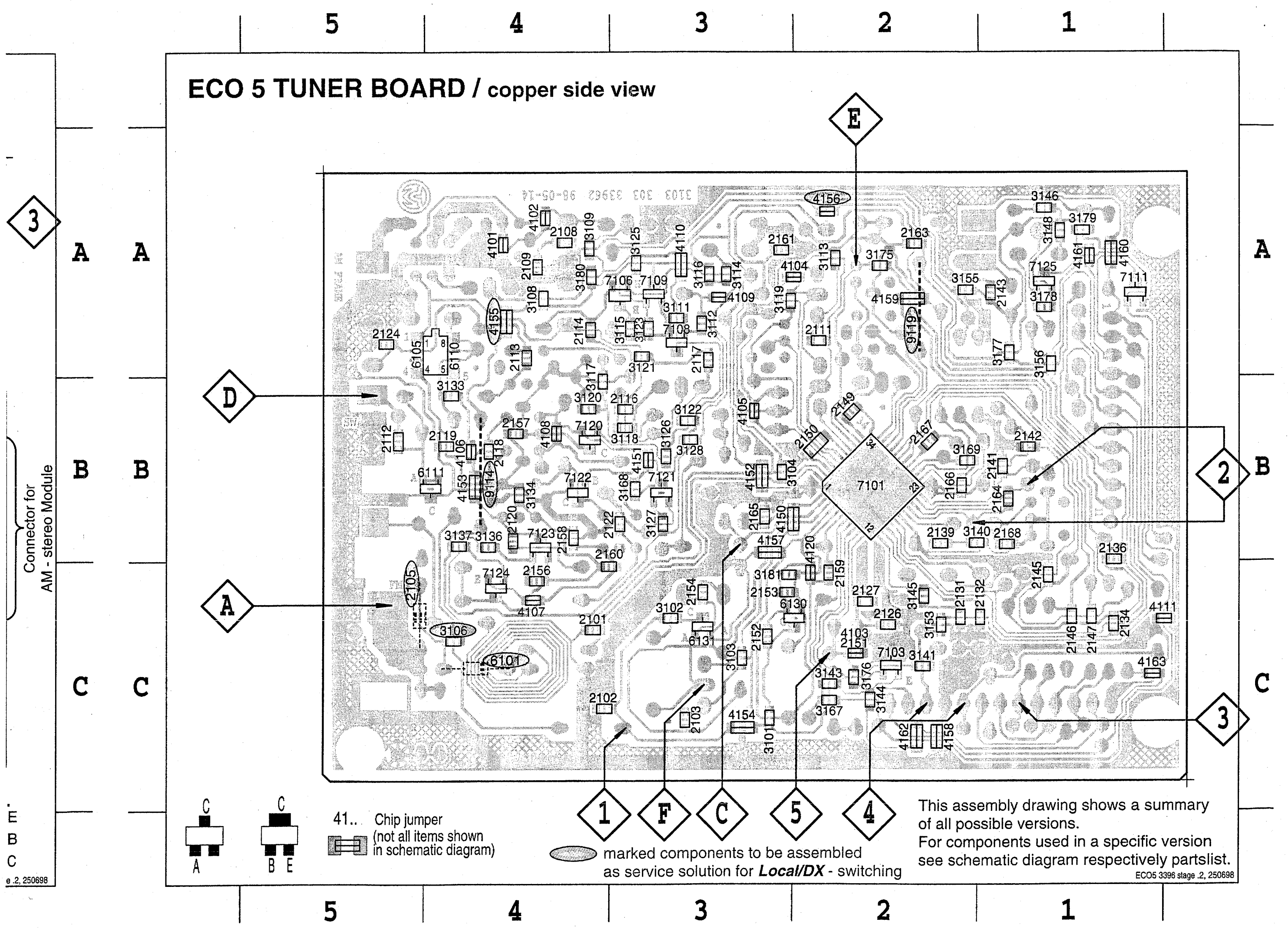
BLOCKDIAGRAM

TUNER BOARD
ECO 5 systems



RADIO IC
TEA 5757T
1101
(1102)
FM
V Loop
FM-RF
V Stab A
10,7 MHz
V Stab B
10,7 MHz
buffer ampl.
RDS
(MPX)
Discr.
LF filter
VCO
Vcc1
Vdd
Vcc2
Vcc
1124
right
left
4
1
3
39
37
35
33
18
10
11
9
43
FM frontend
FM Mixer
IF1
IF2
FM Det.
Stereo Decoder
right
15
left
14
stereo
24
FM-Osc.
5
FM Osc.
Pre-scaler
Multi-plexer
Version
1126
1121
stereo
clock
data
enable
6
AM-Osc.
AM-FRAME AERIAL
6
AM Osc.
CONTROL
clock 27
data 28
enable 29
1103
AM-RF
2
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
RDS
(MPX)
programmable output ports
P1
31
P0
30
8
Charge pump
38
34
23
7
22
40
41
36
44
32
19
20
25
AFC
AFC -
AFC +
Reference Oscillator
75kHz
MW/LW
AM-RF,
AM-Osc.
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
V Stab A
V Stab B
V Stab B
A
B
C
1
2
3
4
4
5
ECO5 sys., 110297

2101	C4
2102	C4
2103	C3
2108	A4
2109	A4
2111	A2
2112	B5
2113	A4
2114	A4
2116	B3
2117	A3
2118	B4
2119	B4
2120	B4
2122	B3
2124	A5
2126	C2
2127	C2
2131	C2
2132	C1
2134	C1
2136	B1
2139	B2
2141	B1
2142	B1
2143	A1
2145	C1
2146	C1
2147	C1
2149	B2
2150	B2
2151	C2
2152	C3
2153	C3
2154	C3
2156	C4
2157	B4
2158	B4
2159	C2
2160	C4
2161	A3
2163	A2
2164	B1
2165	B3
2166	B2
2167	B2
2168	B1
3101	C3
3102	C3
3103	C3
3104	B3
3106	C4
3108	A4
3109	A4
3111	A3
3112	A3
3113	A2
3114	A3
3115	A3
3116	A3
3117	B4
3118	B3
3119	A3
3120	B4
3121	A3
3122	B3
3123	A3
3125	A3
3126	B3
3127	B3
3128	B3
3133	B4
3134	B4
3136	B4
3137	B4
3140	B2
3141	C2
3143	C2
3144	C2
3145	C2
3146	A1
3148	A1
3153	C2
3155	A2
3156	A1
3167	C2
3168	B3
3169	B2
3175	A2
3176	C2
3177	A1
3178	A1
3179	A1
3180	A4
3181	C3
4101	A4
4102	A4
4103	C2
4104	A2
4105	B3
4106	B4
4107	C4
4108	B4
4109	A3
4110	A3
4111	C1
4120	C2
4150	B2
4151	B3
4152	B3
4153	B4
4154	C3
4155	A4
4156	A2
4157	B3
4158	C2
4159	A2
4160	A1
4161	A1
4162	C1
4163	C1
6105	A4
6110	A4
6111	B4
6130	C2
6131	C3
7101	B2
7103	C2
7106	A3
7108	A3
7109	A3
7111	A1
7120	B4
7121	B3
7122	B4
7123	B4
7124	C4
7125	A1



ECO 5 TUNER BOARD / copper side view

41.. Chip jumper (not all items shown in schematic diagram)

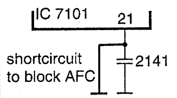
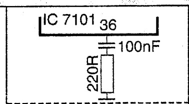
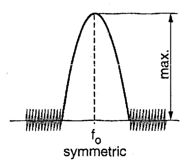
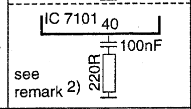
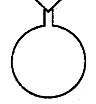
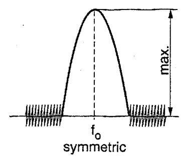
marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 3396 stage .2, 250698

e 2, 250698

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F		5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX ↕
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV		5111	4	
			 see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B  Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	4	 ↕
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		↕
	560kHz		560kHz	5102		

ECO5, discr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

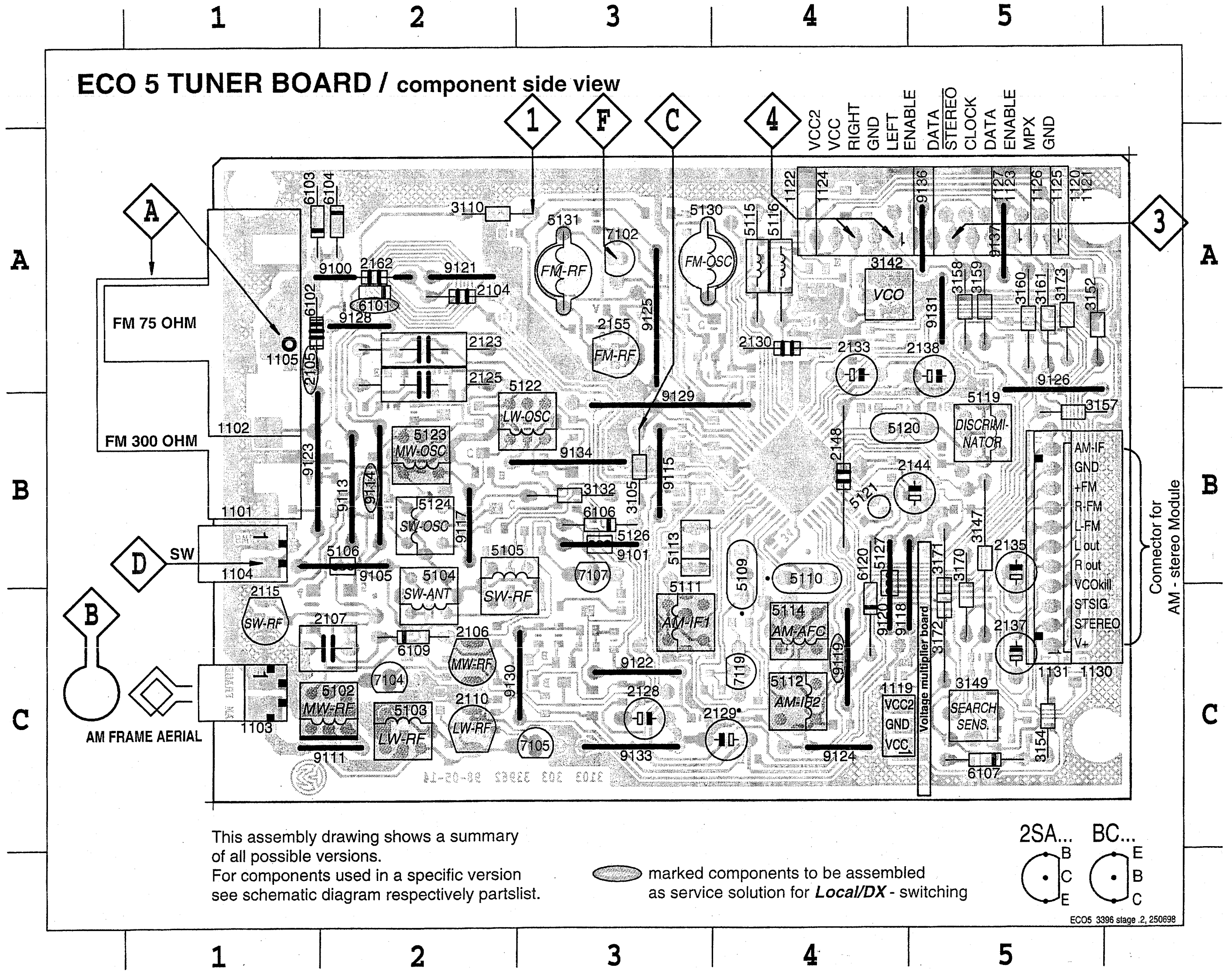
2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

↕ Repeat

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		



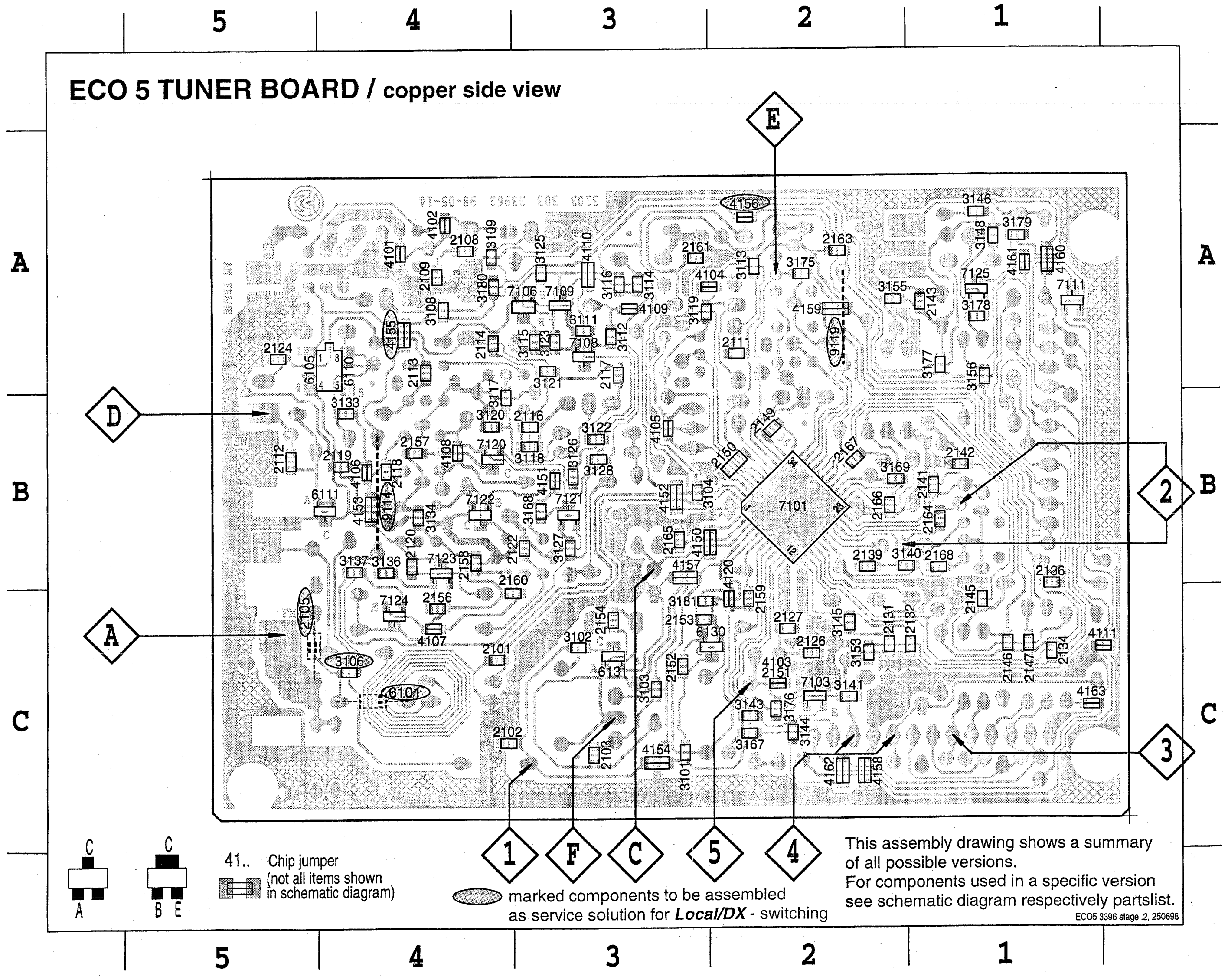
1
2
3
4
5
A
B
C
1
F
C
4
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
3
A
FM 75 OHM
FM 300 OHM
D
SW
B
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
DISCRIMI-NATOR
SEARCH SENS.
Voltage multiplier board
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
VCC2
GND
VCC
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C
ECO5 3396 stage 2, 250698

ECO 5 TUNER BOARD / component side view

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4105	B3	4153	B4	6105	A4	7120	B4
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4106	B4	4154	C3	6110	A4	7121	B3
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4107	C4	4155	A4	6111	B4	7122	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4108	B4	4156	A2	6130	C2	7123	B4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4109	A3	4157	B3	6131	C3	7124	C4
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4110	A3	4158	C2	7101	B2	7125	A1
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	3181	C3	4111	C1	4159	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4101	A4	4120	C2	4160	A1	7106	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4102	A4	4150	B2	4161	A1	7108	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4103	C2	4151	B3	4162	C1	7109	A3		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4104	A2	4152	B3	4163	C1	7111	A1		



5
4
3
2
1
A
B
C
E
D
A
2
3
1
F
C
5
4
7101
C
A
B E
41..
Chip jumper
(not all items shown in schematic diagram)
ECO5 3396 stage 2, 250698

ECO 5 TUNER BOARD / copper side view

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER

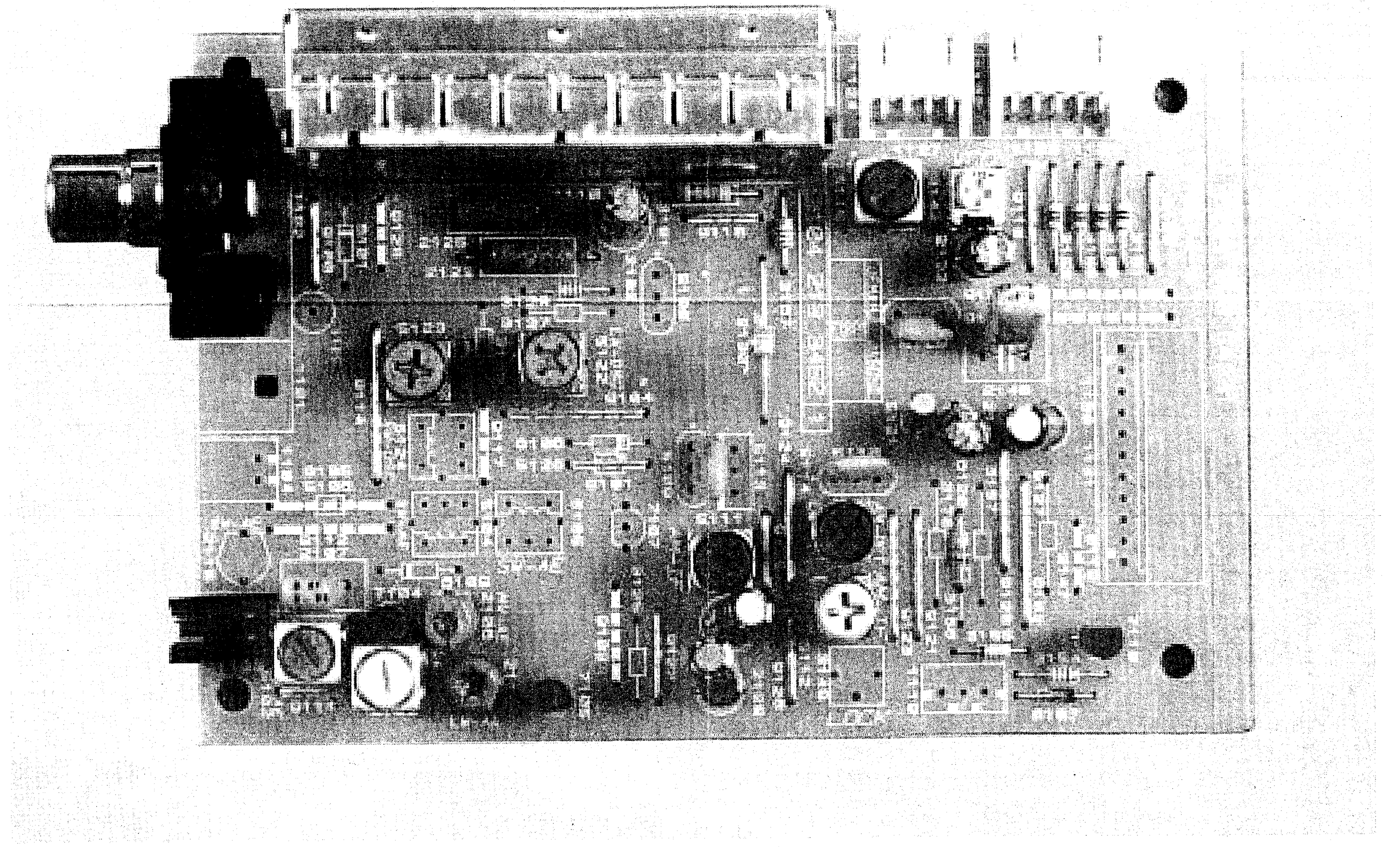
Wav
VARICA
FM 87.5 - (65.81 - 74,
MW FM/AM-versi 530 - 1
FM/MW-vers 531 - 1
LW 153 - 2
MW FM/MW/LW- 531 - 1
FM IF
FM
FM RF
FM 87.5 - (65.81 - 74
VCO
FM
AM IF
MW
AM AF **MW**
AM RF
MW 4) FM/MW/LW- (9 531 -
LW
MW FM/AM-ve 530 -

Use servic

1) If sensiti
(input si

3) For AM

↕ Repeat



TUNER 95 BOARD

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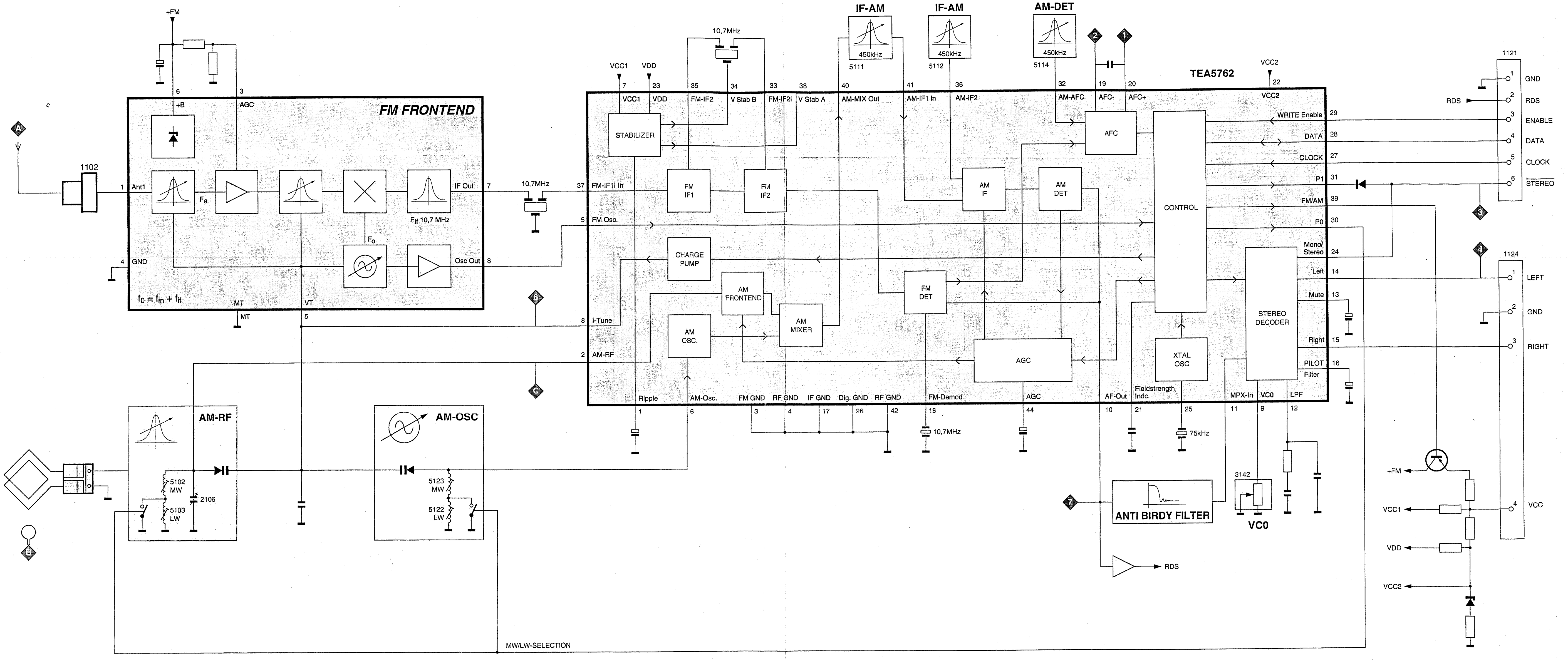
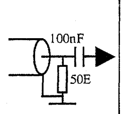
Adjustmant table 7D-2
Component layout..7D-2
Circuit diagram...7D-3
Partslist 7D-4

BLOCKDIAGRAM


+FM
FM FRONTEND
+B
AGC
1102
Ant1
GND
Fa
Fif 10,7 MHz
F0
IF Out
Osc Out
f0 = fin + fif
MT
VT
10,7MHz
IF-AM
450kHz
5111
IF-AM
450kHz
5112
AM-DET
450kHz
5114
TEA5762
VCC1
VDD
VCC2
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
STABILIZER
FM-IF1I In
FM Osc.
I-Tune
AM-RF
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
AM IF
AM DET
FM DET
AGC
AFC
CONTROL
XTAL OSC
STEREO DECODER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VC0
LPF
10,7MHz
75kHz
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
1124
LEFT
GND
RIGHT
VCC
+FM
VCC1
VDD
VCC2
AM-RF
5102 MW
5103 LW
2106
AM-OSC
5123 MW
5122 LW
3142
ANTI BIRDY FILTER
VC0
RDS
MW/LW-SELECTION
A
B
C
1
2
3
4
6
7

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave ***short pin 21 (IC7101) to ground***	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	 ◇C	MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave			5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B *	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM		198kHz	5103		MAX

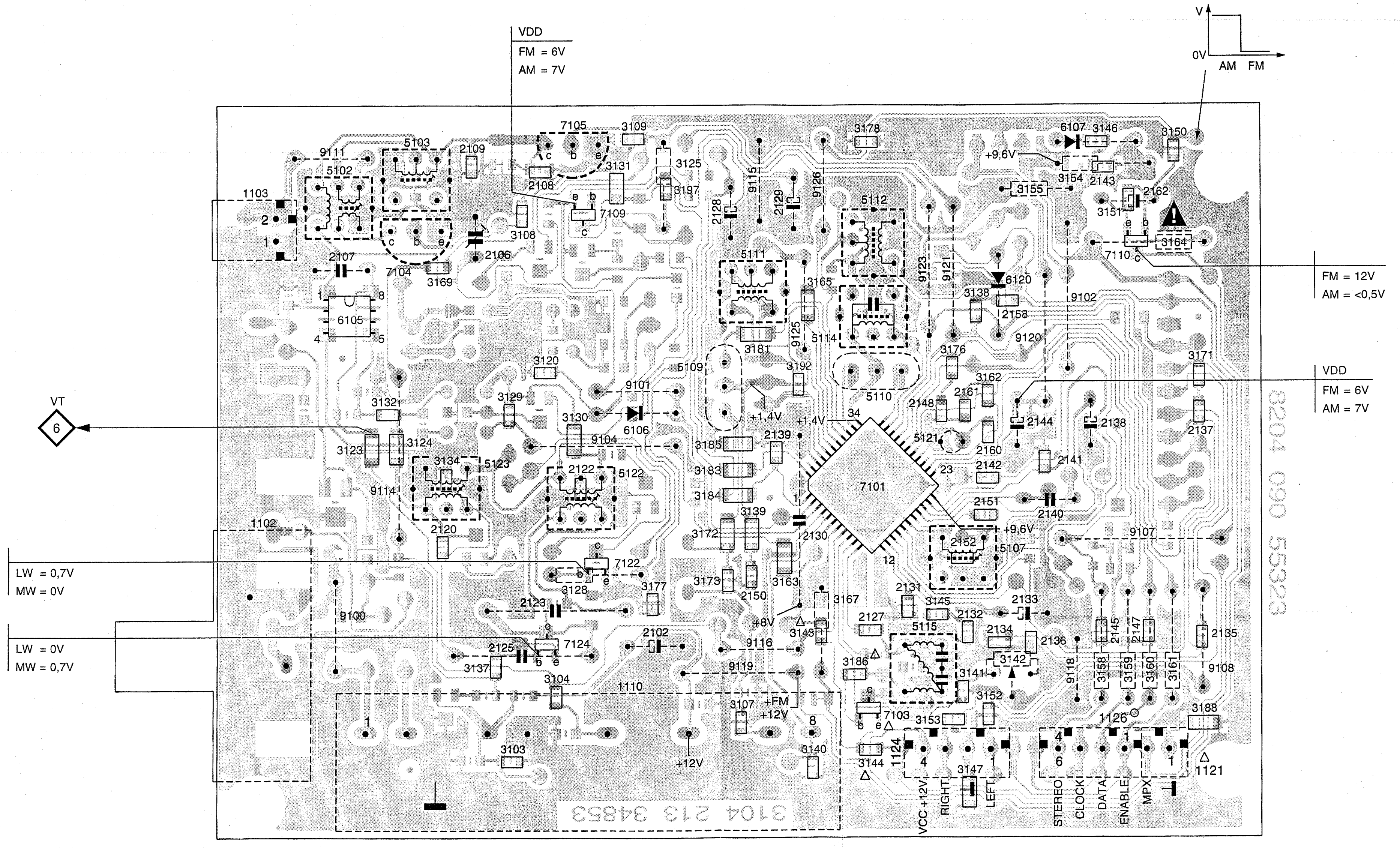
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

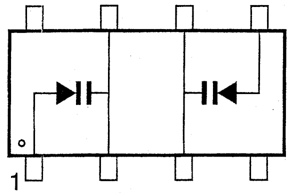
↕ repeat

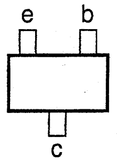
1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	3188	G11	5111	C8	6106	E7	7110	D11	9108	G11	9121	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	3192	D8	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8	3197	C7	5114	D8	6120	D10	7124	G6	9114	E5	9125	D8
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	5102	C4	5115	G9	7101	E9	9100	F4	9115	C8	9126	C8
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	5103	C5	5121	E9	7103	G9	9101	E7	9116	G8		
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	5107	F10	5122	E7	7104	D5	9102	D10	9118	G10		
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	5109	D7	5123	E5	7105	B6	9104	E6	9119	G7		
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	5110	E9	6105	D4	7109	C6	9107	F11	9120	D10		

TUNER 95 bis Combi: Copper side view


VDD
FM = 6V
AM = 7V
V
0V
AM FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
7105
3109
5103
2109
9111
5102
1103
2108
3131
3125
3197
7109
3108
2106
2107
7104
3169
6105
3178
6107
3146
3150
+9,6V
3155
3154
2143
2162
3151
3164
7110
5112
5111
3165
5114
3181
6120
3138
2158
9102
9120
3176
3171
5110
5109
3192
9101
6106
3120
3129
3130
3132
3123
3124
3134
5123
9114
2122
5122
2120
+1,4V
+1,4V
34
2139
3185
3183
3184
3139
7101
2148
2161
3162
2144
2138
2137
5121
2160
2142
2141
23
2151
2140
9107
2152
+9,6V
5107
12
2130
3172
3173
2150
3163
3167
1102
7122
3128
3177
9100
2123
2102
+8V
3143
2127
2131
3145
2132
2133
5115
2134
3142
2136
2135
2145
2147
3158
3159
3160
3161
9118
9108
9116
9119
3186
3141
2125
7124
3137
3104
1110
3107
+FM
+12V
8
3152
7103
3153
1126
3188
3140
1124
3144
3147
3103
+12V
1121
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
3104 213 34853
8204 090 55323

IC 6105





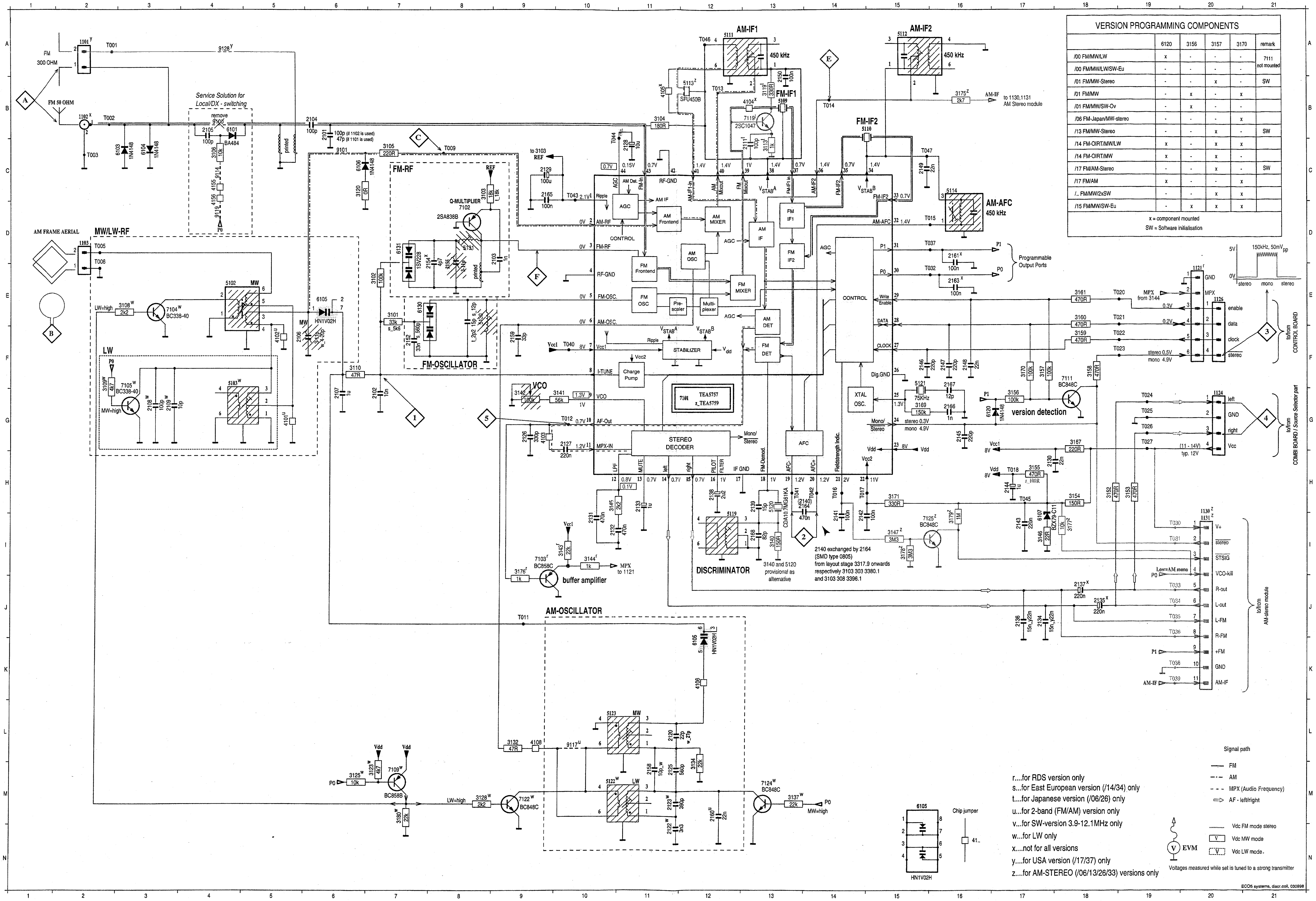
△ only in RDS version (04121)

○ not in RDS version (04341)

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

LEU0149
9813

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50 OHM
AM FRAME AERIAL
MW/LW-RF
LW
Service Solution for Local/DX - switching
remove 9100
FM-RF
Q-MULTIPLIER 7102
2SA838B
FM-OSCILLATOR
VCO
AM-IF1
450 kHz
AM-IF2
FM-IF1
FM-IF2
AM-AFC
450 kHz
to 1130,1131 AM Stereo module
AGC
AM Frontend
AM MIXER
AM IF
FM IF1
FM IF2
FM Frontend
AM OSC
FM MIXER
FM OSC
Pre-scaler
Multi-plexer
AM DET
FM DET
STABILIZER
Charge Pump
CONTROL
XTAL OSC.
STEREO DECODER
AFC
7101 TEA5757 z_TEA5759
Programmable Output Ports
version detection
buffer amplifier
DISCRIMINATOR
3140 and 5120 provisional as alternative
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
AM-OSCILLATOR
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
150kHz, 50mVpp
stereo mono stereo
Chip jumper
41..
HN1V02H
EVM

	6120	3156	3157	3170	remark
VERSION PROGRAMMING COMPONENTS					
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path
- FM
- AM
- MPX (Audio Frequency)
- AF - left/right

Vdc FM mode stereo
Vdc MW mode
Vdc LW mode.

Voltages measured while set is tuned to a strong transmitter

ECO5 systems, discr.coil, 030998

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	
3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

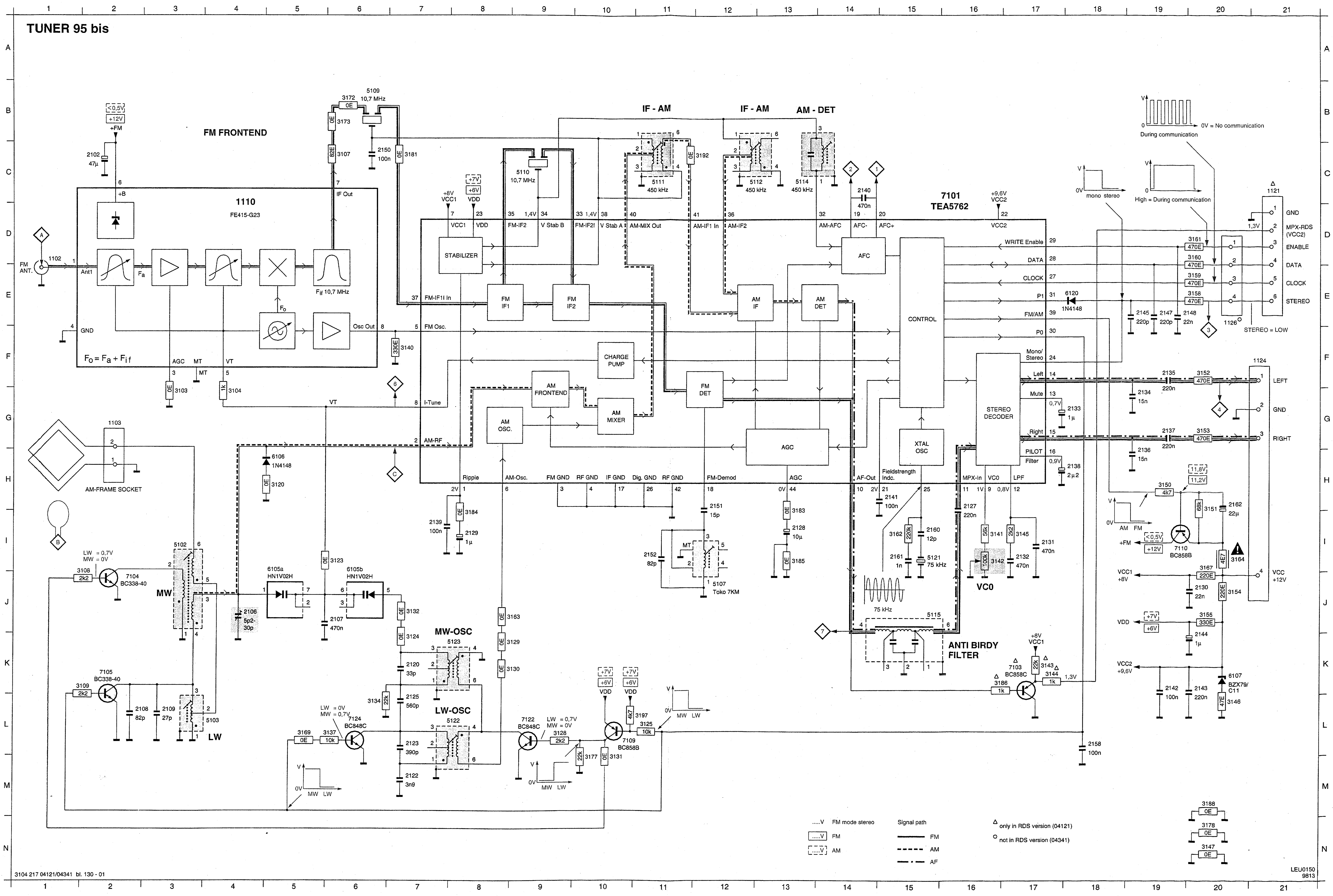
Note: Only the parts mentioned in this list are normal service spare parts.

7D-3

7D-3

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2139	I7
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3120	H5
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3147	N20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3178	N20
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6106	H5
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis



FM FRONTEND
1110
FE415-G23
FM ANT.
1102
Ant1
Fa
Fif 10,7 MHz
Fo
Osc Out
IF Out
GND
+B
AGC
MT
VT
Fo = Fa + Fif
<0,5V
+12V
+FM
2102 47µ
3172 0E
5109 10,7 MHz
3173
3107 82E
2150 100n
3181
3140 330E
3103 0E
3104 1k
5110 10,7 MHz
IF - AM
IF - AM
AM - DET
5111 450 kHz
5112 450 kHz
5114 450 kHz
3192 0E
2140 470n
7101
TEA5762
+8V VCC1
+7V +8V VDD
+9,6V VCC2
VCC1
VDD
FM-IF2
V Stab B
FM-IF2!
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
37 FM-IF1I In
5 FM Osc.
8 I-Tune
2 AM-RF
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
WRITE Enable 29
DATA 28
CLOCK 27
P1 31
FM/AM 39
P0 30
Mono/Stereo 24
Left 14
Mute 13
Right 15
PILOT 16
Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
6120 1N4148
3161 470E
3160 470E
3159 470E
3158 470E
2145 220p
2147 220p
2148 22n
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
1126
STEREO = LOW
0V = No communication
During communication
High = During communication
mono stereo
1124
LEFT
GND
RIGHT
2135 220n
3152 470E
2134 15n
2133 1µ
2137 220n
3153 470E
2136 15n
2138 2µ2
11,8V
11,2V
3150 4k7
3151 68k
2162 22µ
7110 BC858B
AM FM
<0,5V
+12V
+FM
3164 4E7
3167 220E
VCC1 +8V
VCC +12V
2130 22n
3154 220E
VDD
+7V +6V
3155 330E
2144 1µ
VCC2 +9,6V
6107 BZX79/C11
2142 100n
2143 220n
3146 47E
AM-FRAME SOCKET
1103
MW
5102
7104 BC338-40
3108 2k2
LW = 0,7V MW = 0V
6106 1N4148
3120 0E
2106 5p2-30p
6105a HN1V02H
6105b HN1V02H
3123 0E
2107 470n
3132 0E
3124 0E
MW-OSC
5123
LW-OSC
5122
2120 33p
2125 560p
3134 22k
2123 390p
2122 3n9
7105 BC338-40
3109 2k2
2108 82p
2109 27p
5103
LW
7124 BC848C
3169 0E
3137 10k
LW = 0V MW = 0,7V
MW LW
3163 0E
3129 0E
3130 0E
7122 BC848C
LW = 0,7V MW = 0V
3128 2k2
3177 22k
3131 0E
7109 BC858B
3197 4k7
3125 10k
+7V +6V VDD
2139 100n
3184 0E
2129 1µ
2151 15p
2152 82p
5107 Toko 7KM
3183 0E
2128 10µ
3185 0E
2141 100n
3162 220k
2160 12p
2161 1n
5121 75 kHz
75 kHz
5115
ANTI BIRDY FILTER
2127 220n
3141 56k
3145 2k2
3142 100k
2131 470n
2132 470n
VC0
+8V VCC1
7103 BC858C
3143 22k
3186 1k
3144 1k
1,3V
2158 100n

.....V FM mode stereo

.....V FM

.....V AM

Signal path

FM

AM

AF

Δ only in RDS version (04121)

o not in RDS version (04341)

3188	0E
3178	0E
3147	0E

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478	⚠ 4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHZ
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

ELECTRICAL PARTS LIST - TUNER 95 BOARD

DIODES

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note : Only the parts mentioned in this list are normal service spare parts.

ETF6-FE TAPE MODULE

(Non-Dolby Version)

TABLE OF CONTENTS

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Brief Introduction 9-3
Connector assignment... 9-4
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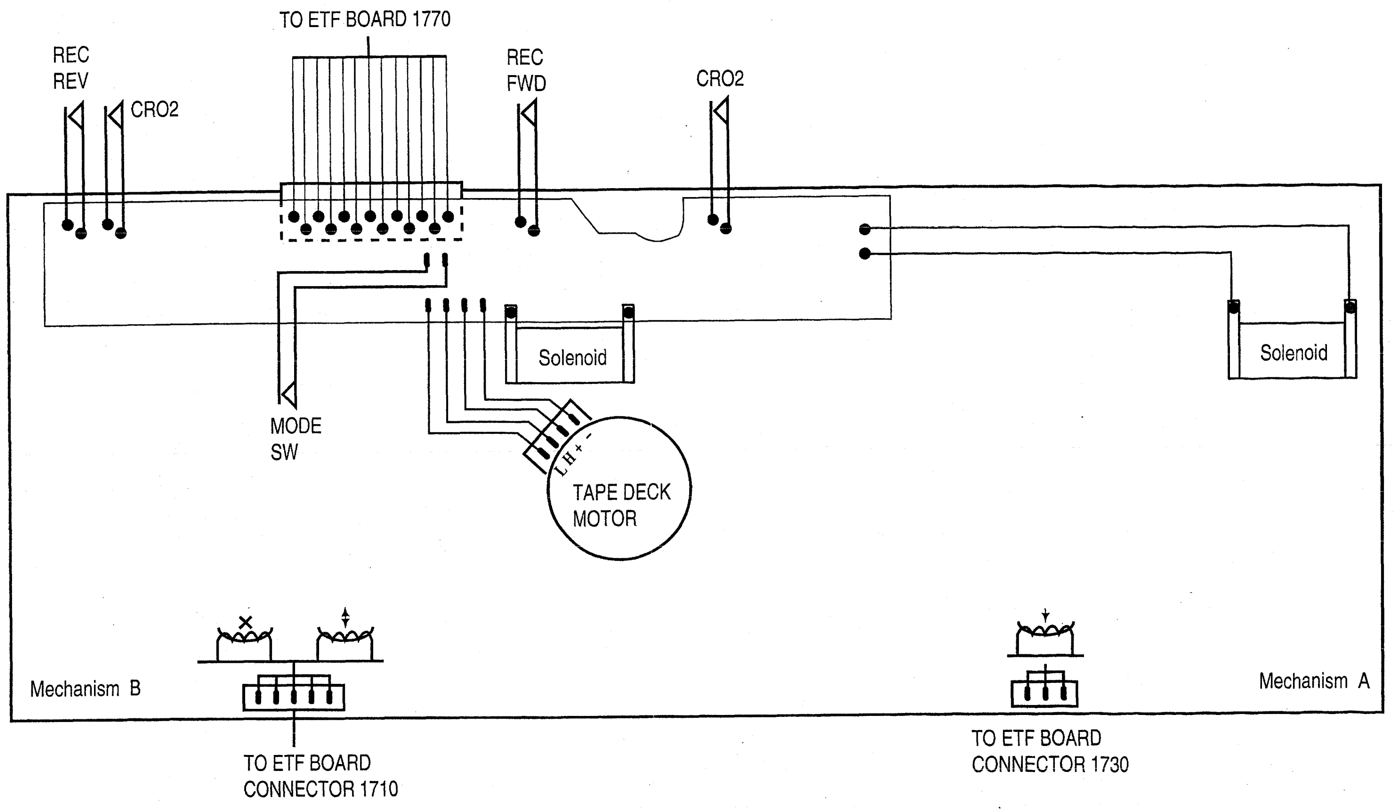
ETF6-FE Non-dolby board layouts 9-6
Analog Circuit diagram 9-7
Servo Circuit diagram 9-8
Exploded views & parts list....................................... 9-9
Electrical parts list.. 9-13

Tapedeck wiring (Double deck)



TO ETF BOARD 1770
REC REV
CRO2
REC FWD
CRO2
Solenoid
Solenoid
MODE SW
TAPE DECK MOTOR
Mechanism B
Mechanism A
TO ETF BOARD CONNECTOR 1710
TO ETF BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

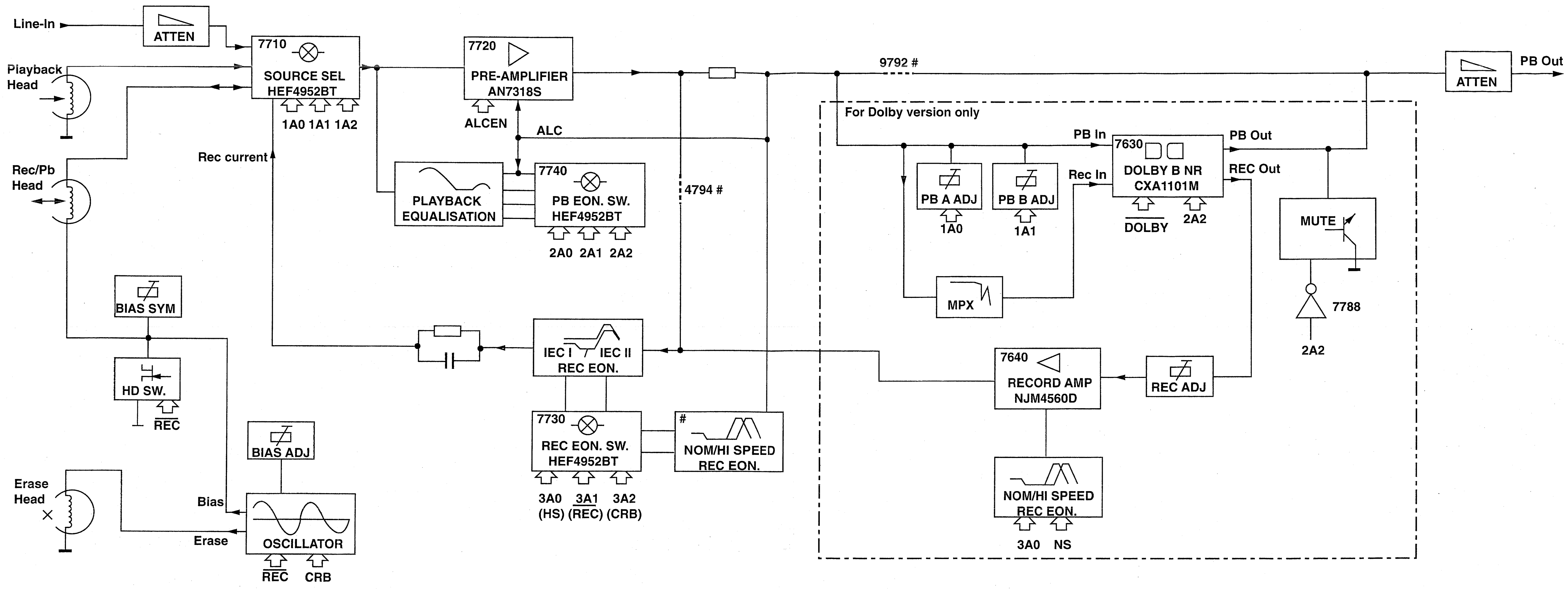
MODULE	ETF6-FE	
VARIANT	**1**	**2**
NAME	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double
Autoreverse	yes (B)	no
Auto-replay	no	yes (B)
Motor configuration	single	single
Auto tape type selection	yes	yes
Dolby B type Noise Reduction	no	no
19 kHz pilot suppression	no	no
High speed dubbing	yes	yes

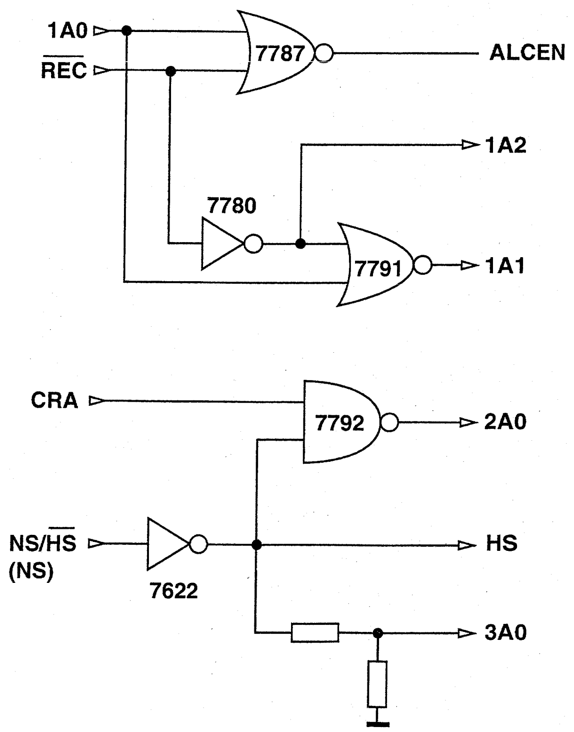
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

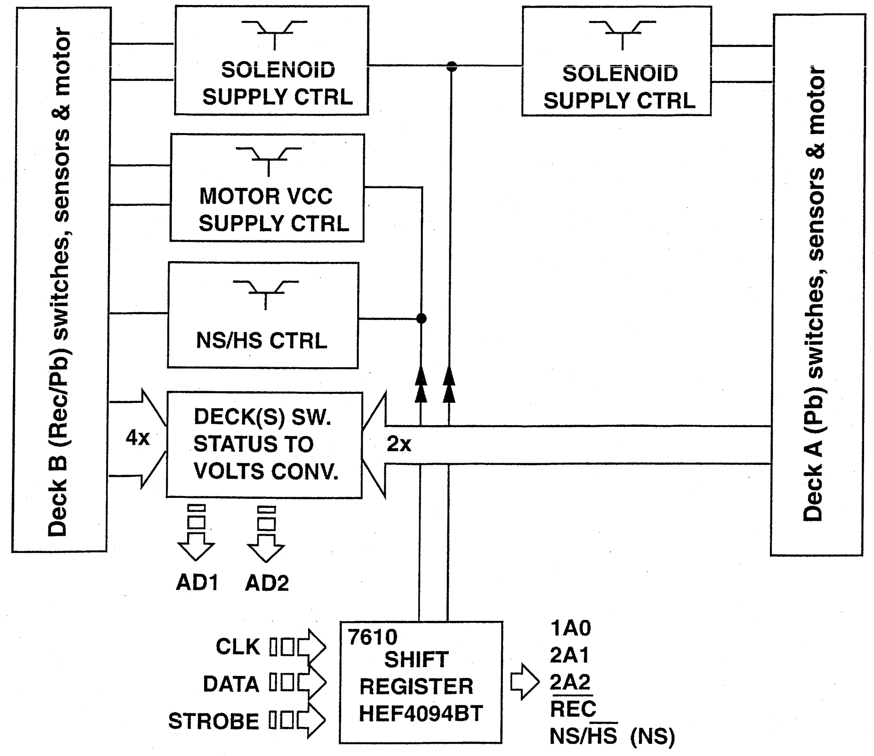
Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
1760	-	-
1770	use	use
3723	12k	15k
3724	12k	15k
3743	1k2	1k
3744	1k2	1k
3769	12k	8k2
3772	4k7	5k6
3774	10k	8k2

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
Rec current
PLAYBACK EQUALISATION
7740
PB EON. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I
IEC II
REC EON.
7640
RECORD AMP
NJM4560D
REC ADJ
7730
REC EON. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED REC EON.
NOM/HI SPEED REC EON.
3A0 NS
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1 AD2
Deck A (Pb) switches, sensors & motor
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

13. Motor Speed
During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

15. IC7630 (CXA1551M)
IC7630 (CXA1101M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) in
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For ETF6... only)***

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For ETF5... only)***

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740

DECK B CONTROL INTERFACE ***(For ETF5... Double Deck only)***

O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply	
O	6	Vcc	Deck / Motor supply	
O	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	
O	9	H	H pin for motor	
O	10	L	L pin for motor	

CONNECTOR 1750

DECK A CONTROL INTERFAC ***(For ETF5... Double Deck only)***

O	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	2	PHOTO A	Photo sensor output (tape movement indication)	
O	3	SOL A	Solenoid supply	
O	4	Vcc	Deck/Motor supply	
O	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	6	GND M	Deck/Motor ground	

CONNECTOR 1760

DECK B CONTROL INTERFACE ***(For Single Deck only)***

O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply	
O	6	Vcc	Deck / Motor supply	
O	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	

CONNECTOR 1770

DECK A & B CONTROL INTERFACE ***(For ETF6... only)***

O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply for deck B	
O	6	Vcc	Deck / Motor supply	
O	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	
O	9	L	L pin for motor	
O	10	H	H pin for motor	
O	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
O	12	SOL A	Solenoid supply for deck A	
O	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

# For Auto-reverse version only

* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure

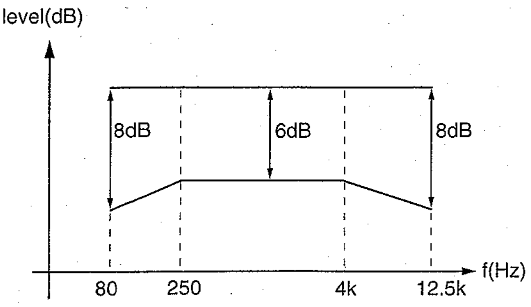


figure. 1

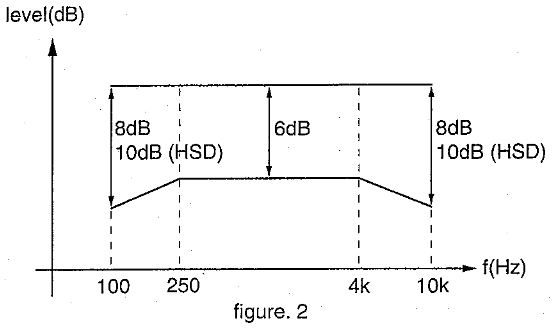


figure. 2

TAPE MECHANISM ELECTRONICS

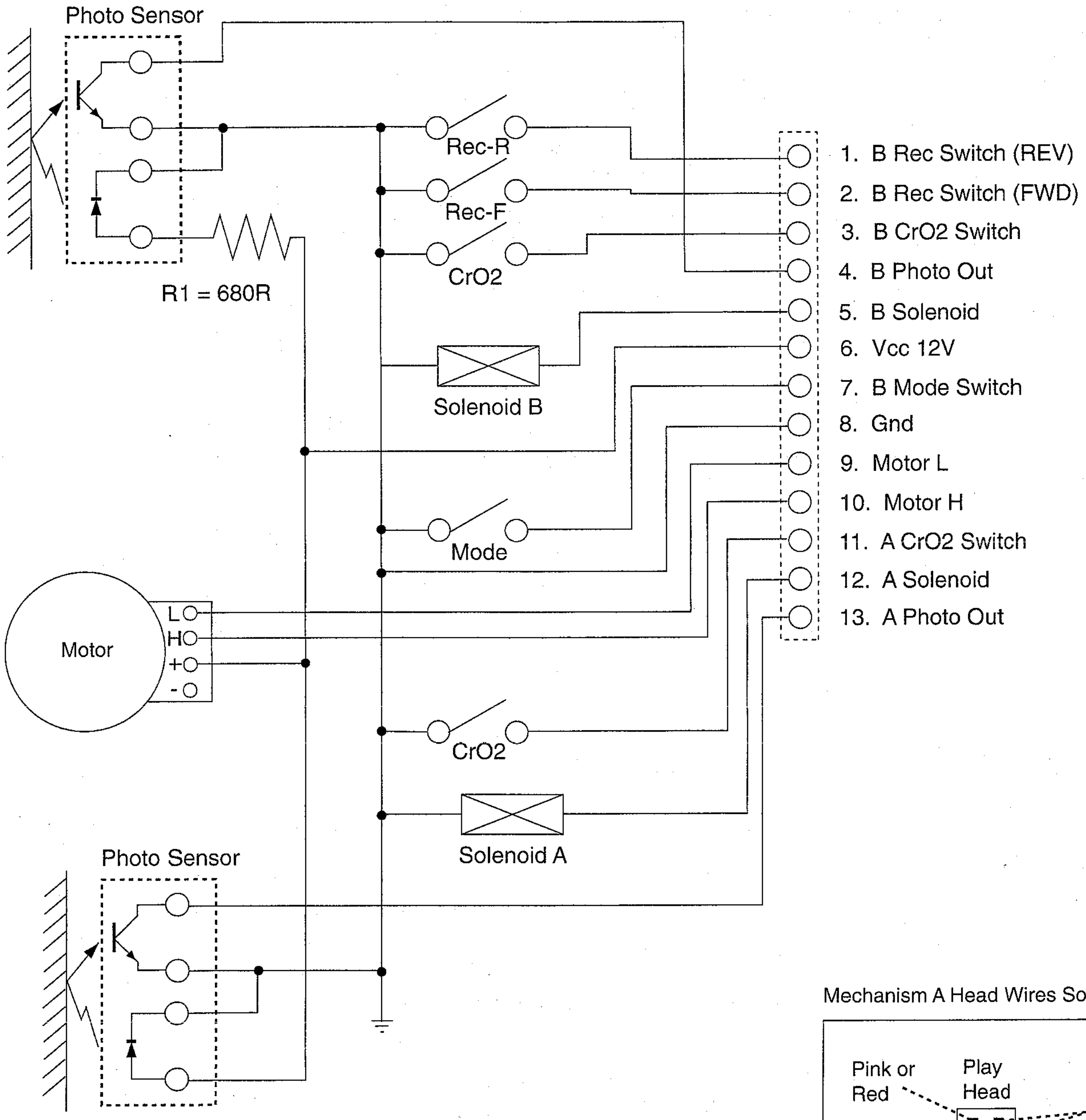
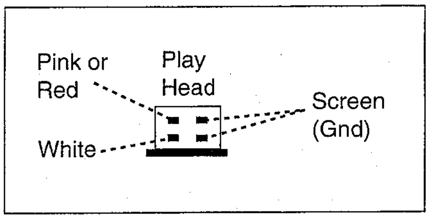
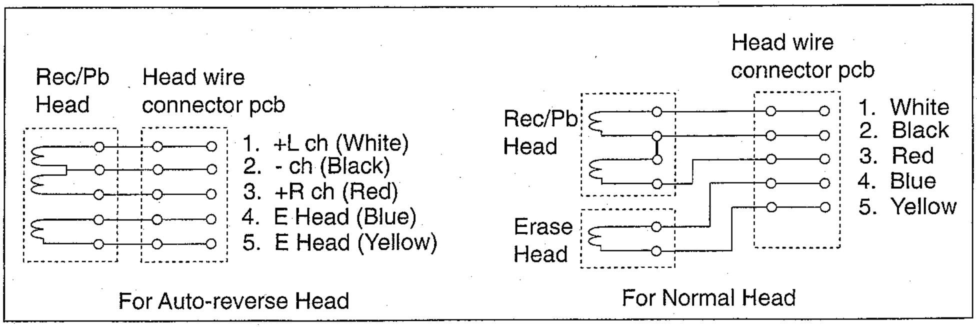


Photo Sensor
Rec-R
Rec-F
CrO2
R1 = 680R
Solenoid B
Mode
Motor
L
H
+
-
CrO2
Solenoid A
Photo Sensor
1. B Rec Switch (REV)
2. B Rec Switch (FWD)
3. B CrO2 Switch
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. Motor L
10. Motor H
11. A CrO2 Switch
12. A Solenoid
13. A Photo Out

Mechanism A Head Wires Soldering

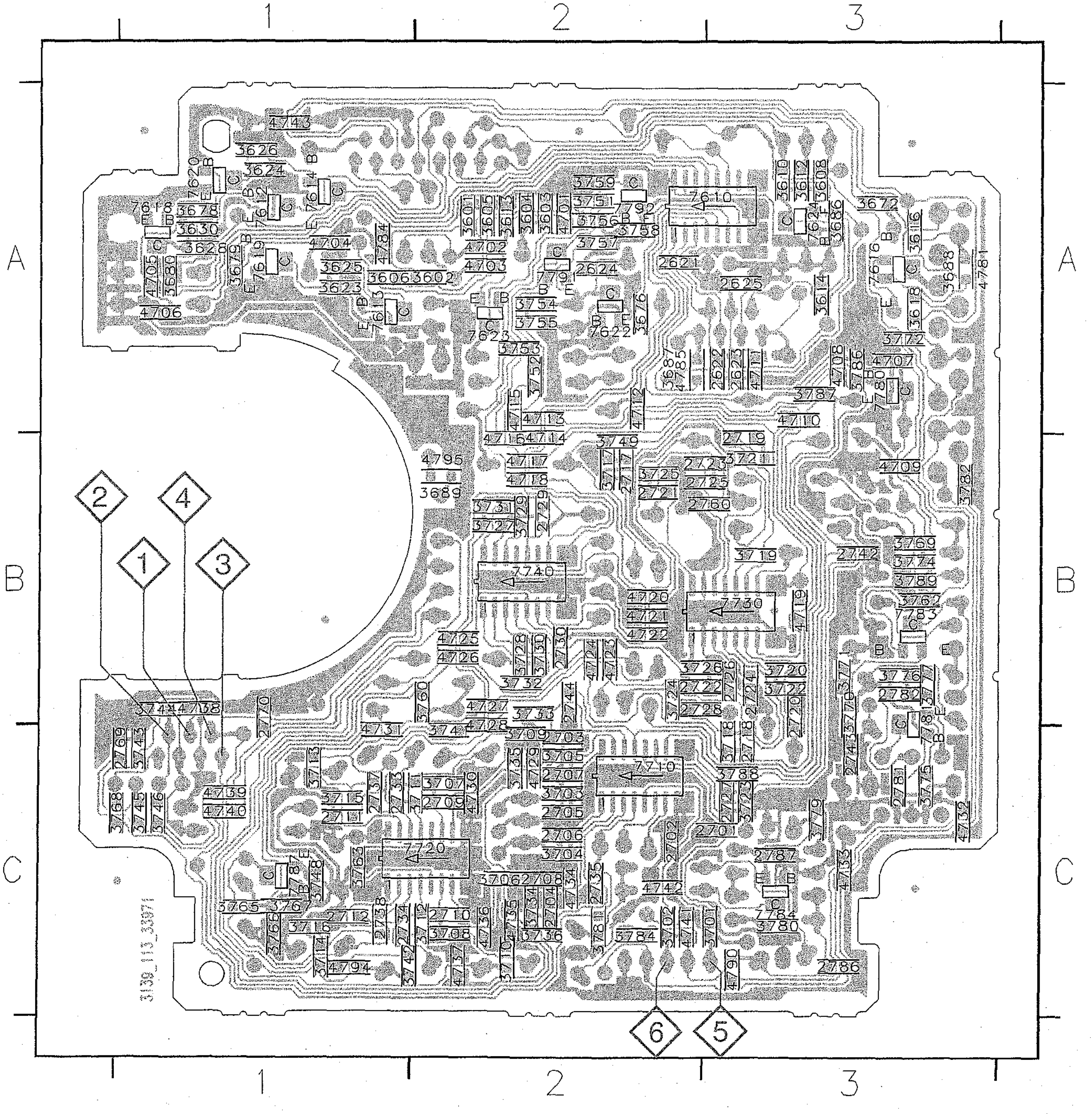

Pink or
Red
Play
Head
Screen
(Gnd)
White

Mechanism B Head Wires Soldering


Rec/Pb
Head
Head wire
connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)
For Auto-reverse Head
Head wire
connector pcb
Rec/Pb
Head
Erase
Head
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

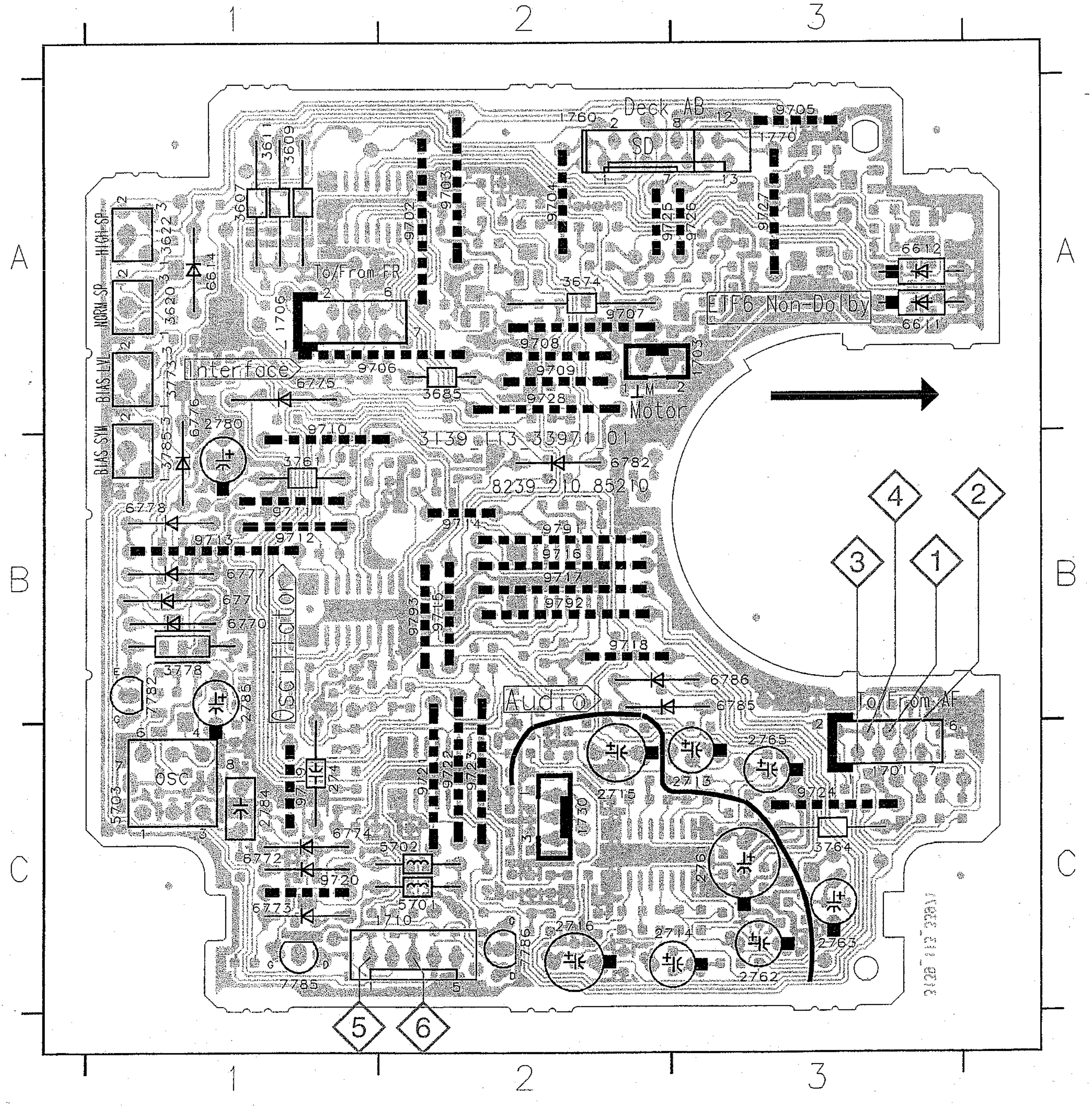
CHIP LAYOUT

2621	A2	2725	B3	3605	A2	3702	C2	3727	B2	3758	A2	3789	B3	4725	B2	7610	A3
2622	A3	2726	B3	3606	A1	3703	C2	3728	B2	3759	A2	4701	A2	4726	B2	7612	A1
2623	A3	2727	C3	3608	A3	3704	C2	3729	B2	3760	B2	4702	A2	4727	B2	7613	A1
2624	A2	2728	B2	3610	A3	3705	C2	3730	B2	3762	B3	4703	A2	4728	C2	7614	A1
2625	A3	2729	B2	3612	A3	3706	C2	3731	B2	3763	C1	4704	A1	4729	C2	7616	A3
2701	C3	2730	B2	3613	A2	3707	C2	3732	B2	3765	C1	4705	A1	4730	C2	7618	A1
2702	C2	2733	C1	3614	A3	3708	C2	3733	B2	3766	C1	4706	A1	4731	C1	7619	A1
2703	C2	2734	C1	3616	A3	3709	C2	3734	C2	3767	C1	4707	A3	4732	C3	7620	A1
2704	C2	2735	C2	3618	A3	3710	C2	3735	C2	3768	C1	4708	A3	4733	C3	7622	A2
2705	C2	2737	C1	3623	A1	3711	C2	3736	C2	3769	B3	4709	B3	4734	C2	7623	A2
2706	C2	2738	C1	3624	A1	3712	C2	3741	C2	3770	B3	4710	A3	4735	C2	7624	A3
2707	C2	2742	B3	3625	A1	3713	C1	3742	C1	3771	B3	4711	A3	4736	C2	7710	C2
2708	C2	2743	C3	3626	A1	3714	C1	3743	C1	3772	A3	4712	A2	4737	C2	7720	C2
2709	C2	2744	B2	3628	A1	3715	C1	3744	B1	3774	B3	4713	A2	4738	B1	7730	B3
2710	C2	2760	B3	3630	A1	3716	C1	3745	C1	3775	C3	4714	B2	4739	C1	7740	B2
2711	C1	2769	C1	3672	A3	3717	B2	3746	C1	3776	B3	4715	A2	4740	C1	7780	A3
2712	C1	2770	B1	3676	A2	3718	C3	3748	C1	3777	B3	4716	B2	4741	C2	7781	B3
2717	B2	2781	C3	3678	A1	3719	B3	3749	B2	3779	C3	4717	B2	4742	C2	7783	B3
2718	C3	2782	B3	3679	A1	3720	B3	3751	A2	3780	C3	4718	B2	4743	A1	7784	C3
2719	B3	2786	C3	3680	A1	3721	B3	3752	A2	3781	C2	4719	B3	4781	A3	7787	C1
2720	B3	2787	C3	3686	A3	3722	B3	3753	A2	3782	B3	4720	B2	4784	A1	7791	A2
2721	B2	3601	A2	3687	A2	3723	C3	3754	A2	3784	C2	4721	B2	4785	A2	7792	A2
2722	B2	3602	A2	3688	A3	3724	B2	3755	A2	3786	A3	4722	B2	4790	C3		
2723	B2	3603	A2	3689	B2	3725	B2	3756	A2	3787	A3	4723	B2	4794	C1		
2724	B3	3604	A2	3701	C3	3726	B2	3757	A2	3788	C3	4724	B2	4795	B2		

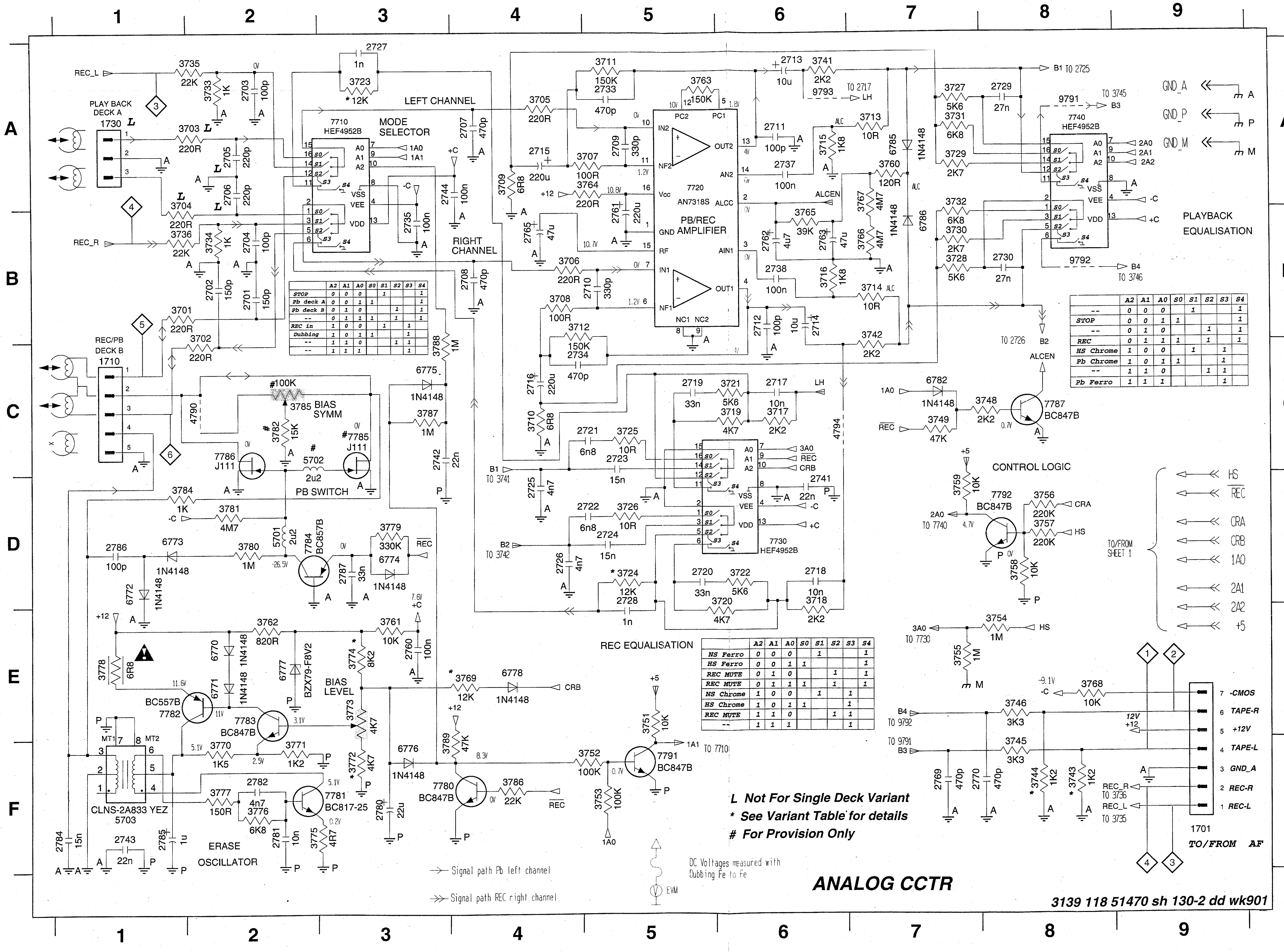


COMPONENT LAYOUT

1701	C3	2716	C2	3609	A1	3785	B1	6773	C1	7785	C1	9710	A1	9720	C1	9792	B2
1703	A3	2741	C1	3611	A1	5701	C2	6774	C1	7786	C2	9711	B1	9721	C2	9793	B2
1706	A1	2761	C3	3620	A1	5702	C2	6775	A1	9702	A2	9712	B1	9722	C2		
1710	C2	2762	C3	3622	A1	5703	C1	6776	A1	9703	A2	9713	B1	9723	C2		
1730	C2	2763	C3	3674	A2	6611	A3	6777	B1	9704	A2	9714	B2	9724	C3		
1760	A2	2765	C3	3685	A2	6612	A3	6778	B1	9705	A3	9715	B2	9725	A2		
1770	A3	2780	A1	3761	B1	6614	A1	6782	B2	9706	A1	9716	B2	9726	A3		
2713	C3	2784	C1	3764	C3	6770	B1	6785	B3	9707	A2	9717	B2	9727	A3		
2714	C3	2785	B1	3773	A1	6771	B1	6786	B3	9708	A2	9718	B2	9728	A2		
2715	C2	3607	A1	3778	B1	6772	C1	7782	B1	9709	A2	9719	C1	9791	B2		


1
2
3
A
B
C
Deck AB
SD
1760
1770
9705
HIGH SP
NORM SP
BIAS LVL
BIAS SW
3622
3620
3773
3785
6614
6776
3607
3611
3609
To/From FR
1706
Interface
9706
6775
3685
9702
9703
9704
9725
9726
9727
3674
9707
9708
9709
9728
1703
M
Motor
ETF6 Non-Dolby
6612
6611
2780
9710
3761
3139 113 3397 101
8239 210 85210
6782
6778
9711
9713
9712
9714
9791
9716
9717
9792
9718
6777
6771
6770
3778
7782
2785
Oscillator
OSC
5703
2784
9719
2741
6774
6772
9720
6773
5702
5701
1710
7785
7786
9793
9715
9721
9722
9723
Audio
1730
2715
2713
2765
6786
6785
To/From AF
1701
9724
3764
2761
2763
2716
2714
2762
1
2
3
4
5
6

ANALOG CIRCUIT


REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1710
7710 HEF4952B
MODE SELECTOR
LEFT CHANNEL
RIGHT CHANNEL
7720 AN7318S
PB/REC AMPLIFIER
7740 HEF4952B
PLAYBACK EQUALISATION
7730 HEF4952B
REC EQUALISATION
BIAS SYMM
PB SWITCH
BIAS LEVEL
ERASE OSCILLATOR
CLNS-2A833 YEZ 5703
CONTROL LOGIC
TO/FROM SHEET 1
1701 TO/FROM AF
GND_A
GND_P
GND_M
-CMOS
TAPE-R
+12V
TAPE-L
GND_A
REC-R
REC-L
Signal path Pb left channel
Signal path REC right channel
DC Voltages measured with Dubbing Fe to Fe
EVM

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For Single Deck Variant
* See Variant Table for details
# For Provision Only

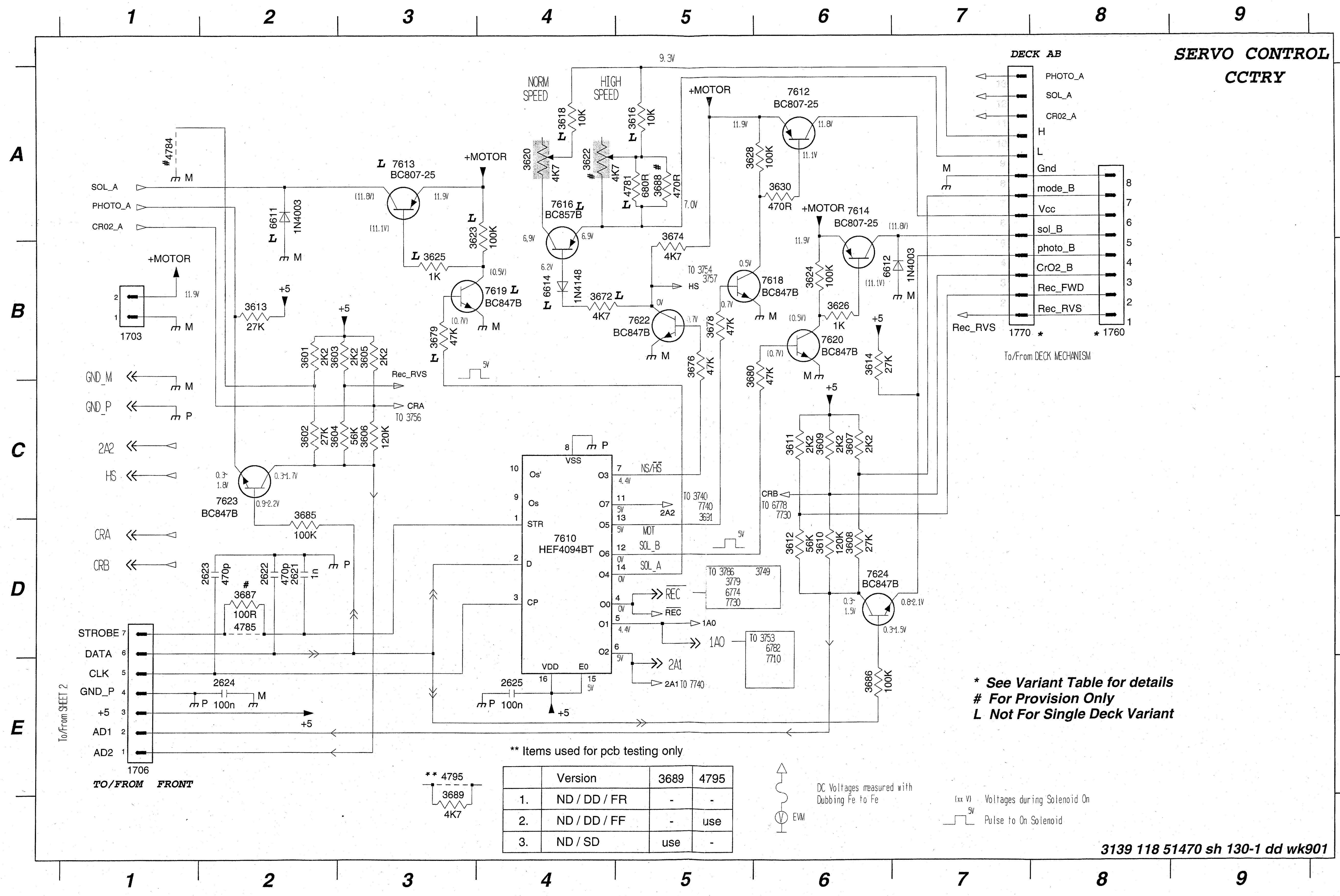
ANALOG CCTR

3139 118 51470 sh 130-2 dd wk901

1701	F9
1710	C1
1730	A1
2701	B2
2702	B2
2703	A2
2704	B2
2705	A2
2706	A2
2707	A4
2708	B4
2709	A5
2710	B5
2711	A6
2712	B6
2713	A6
2714	B6
2715	A4
2716	C4
2717	C6
2718	D6
2719	C5
2720	D5
2721	C5
2722	D5
2723	C5
2724	D5
2725	D4
2726	D4
2727	A3
2728	D5
2729	A8
2730	B8
2733	A5
2734	C4
2735	B3
2737	A6
2738	B6
2741	D6
2742	C3
2743	F1
2744	A3
2760	E3
2761	B5
2762	B6
2763	B6
2765	B4
2769	F7
2770	F7
2780	F3
2781	F2
2782	F2
2784	F1
2785	F1
2786	D1
2787	D3
3701	B1
3702	B2
3703	A2
3704	A1
3705	A4
3706	B4
3707	A5
3708	B4
3709	A4
3710	C4
3711	A5
3712	B4
3713	A7
3714	B7
3715	A6
3716	B6
3717	C6
3718	D6
3719	C6
3720	D6
3721	C6
3722	D6
3723	A3
3724	D5
3725	C5
3726	D5
3727	A7
3728	B7
3729	A7
3730	B7
3731	A7
3732	A7
3733	A2
3734	B2
3735	A2
3736	B1
3741	A6
3742	B7
3743	F8
3744	F8
3745	F8
3746	E8
3748	C8
3749	C7
3751	E5
3752	F5
3753	F5
3754	E8
3755	E7
3756	D8
3757	D8
3758	D8
3759	D7
3760	A7
3761	E3
3762	E2
3763	A5
3764	A5
3765	B6
3766	B7
3767	A7
3768	E8
3769	E4
3770	F2
3771	F2
3772	F3
3773	E3
3774	E3
3775	F2
3776	F2
3777	F2
3778	E1
3779	D3
3780	D2
3781	D2
3782	C2
3784	D1
3785	C2
3786	F4
3787	C3
3788	C3
3789	F3
4790	C2
4794	C6
5701	D2
5702	C2
5703	F1
6770	E2
6771	E2
6772	D1
6773	D1
6774	D3
6775	C3
6776	F3
6777	E2
6778	E4
6782	C7
6785	A7
6786	B7
7710	A3
7720	A5
7730	D6
7740	A8
7780	F4
7781	F3
7782	E1
7783	E2
7784	D2
7785	C3
7786	C2
7787	C8
7791	F5
7792	D8
9791	A8
9792	B8
9793	A6

SERVO CONTROL CIRCUIT

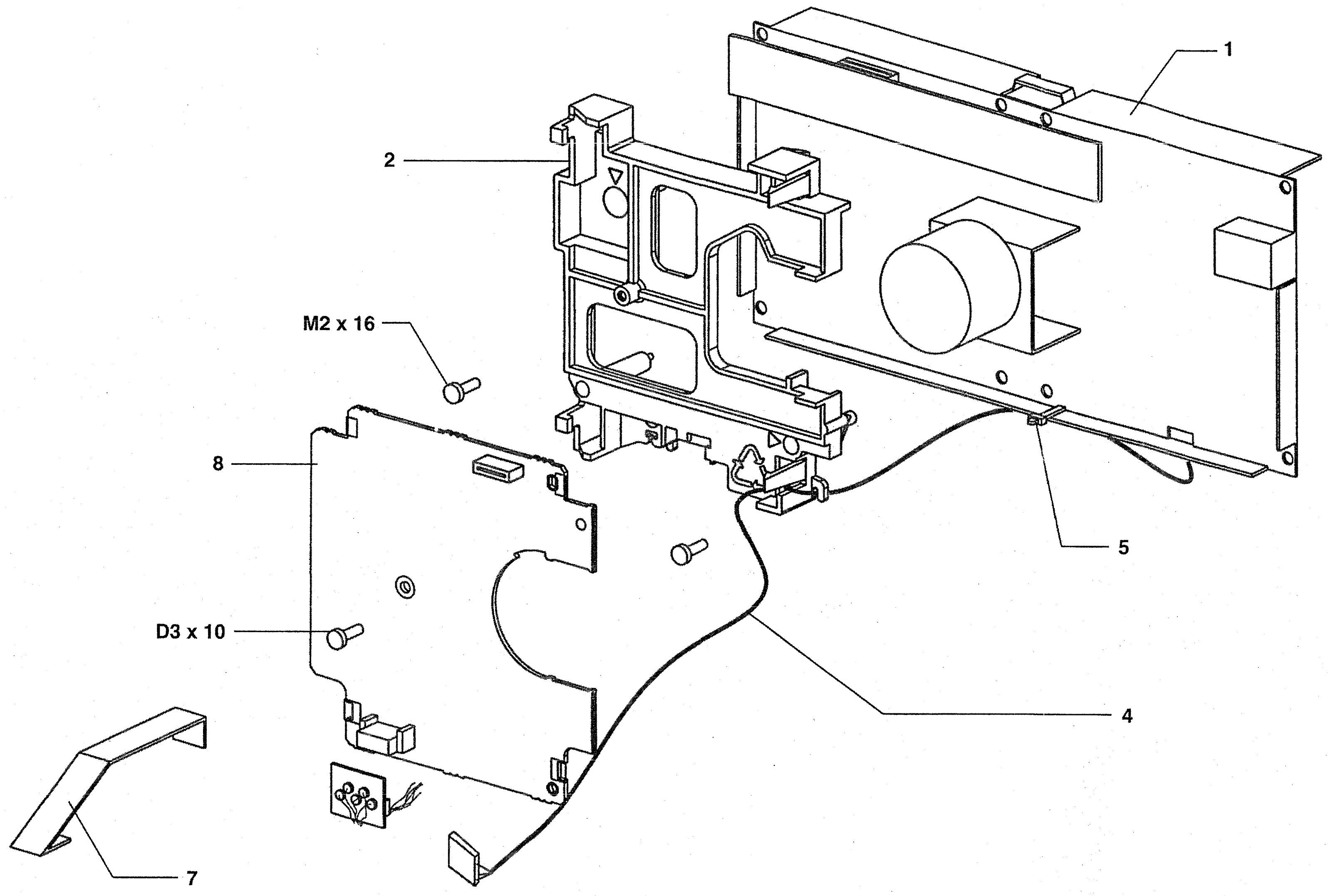
1703 B1	1770 B7	2623 D2	3601 B2	3604 C2	3607 C6	3610 D6	3613 B2	3618 A4	3623 A3	3626 B6	3672 B4	3678 B5	3685 C2	3688 A5	4784 A1	6611 A2	7610 D4	7614 A6	7619 B4	7623 C2
1706 E1	2621 D2	2624 E2	3602 C2	3605 B3	3608 D6	3611 C6	3614 B6	3620 A4	3624 B6	3628 A5	3674 A5	3679 B3	3686 E6	3689 E3	4785 D2	6612 B6	7612 A6	7616 A4	7620 B6	7624 D6
1760 B8	2622 D2	2625 E4	3603 B2	3606 C3	3609 C6	3612 D6	3616 A5	3622 A4	3625 B3	3630 A6	3676 B5	3680 B5	3687 D2	4781 A5	4795 E3	6614 B4	7613 A3	7618 B6	7622 B5	


SERVO CONTROL
CCTRY
1
2
3
4
5
6
7
8
9
A
B
C
D
E
9.3V
NORM SPEED
HIGH SPEED
+MOTOR
7612
BC807-25
7613
BC807-25
7614
BC807-25
7616
BC857B
7618
BC847B
7619
BC847B
7620
BC847B
7622
BC847B
7623
BC847B
7624
BC847B
7610
HEF4094BT
SOL_A
PHOTO_A
CR02_A
DECK AB
H
L
Gnd
mode_B
Vcc
sol_B
photo_B
CrO2_B
Rec_FWD
Rec_RVS
1770
1760
To/From DECK MECHANISM
1703
GND_M
GND_P
2A2
HS
CRA
CRB
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
TO/FROM FRONT
To/From SHEET 2
Os'
Os
STR
D
CP
VSS
VDD
E0
O3
O7
O5
O6
O4
O0
O1
O2
NS/HS
MOT
SOL_B
SOL_A
REC
1A0
2A1
TO 3740 7740 3691
TO 3786 3749 3779 6774 7730
TO 3753 6782 7710
TO 6778 7730
TO 3754 3757
TO 3756
1N4003
1N4148
DC Voltages measured with Dubbing Fe to Fe
EVM
(xx V) Voltages during Solenoid On
Pulse to On Solenoid
3139 118 51470 sh 130-1 dd wk901

* See Variant Table for details
# For Provision Only
L Not For Single Deck Variant

** Items used for pcb testing only

	Version	3689	4795
1.	ND / DD / FR	-	-
2.	ND / DD / FF	-	use
3.	ND / SD	use	-


1
2
M2 x 16
8
D3 x 10
5
4
7

ETF6 TAPE MODULE EXPLODED VIEW

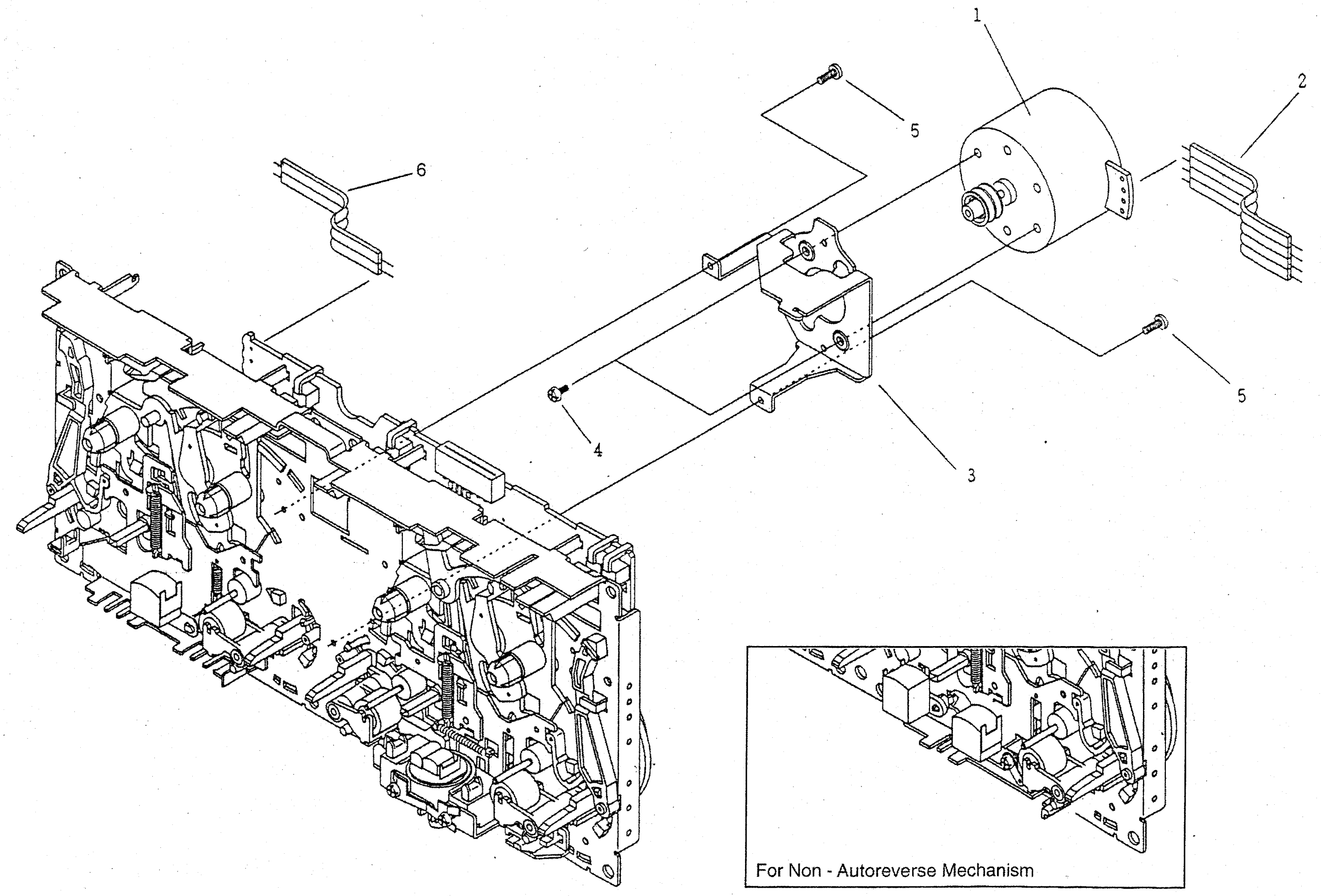
1	4822 691 10673	Autoreverse Mech. CWC44FR02
1	4822 691 10672	Non-Autoreverse Mech. CWC44FF01
7	4822 320 12245	Flex Cable 13 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

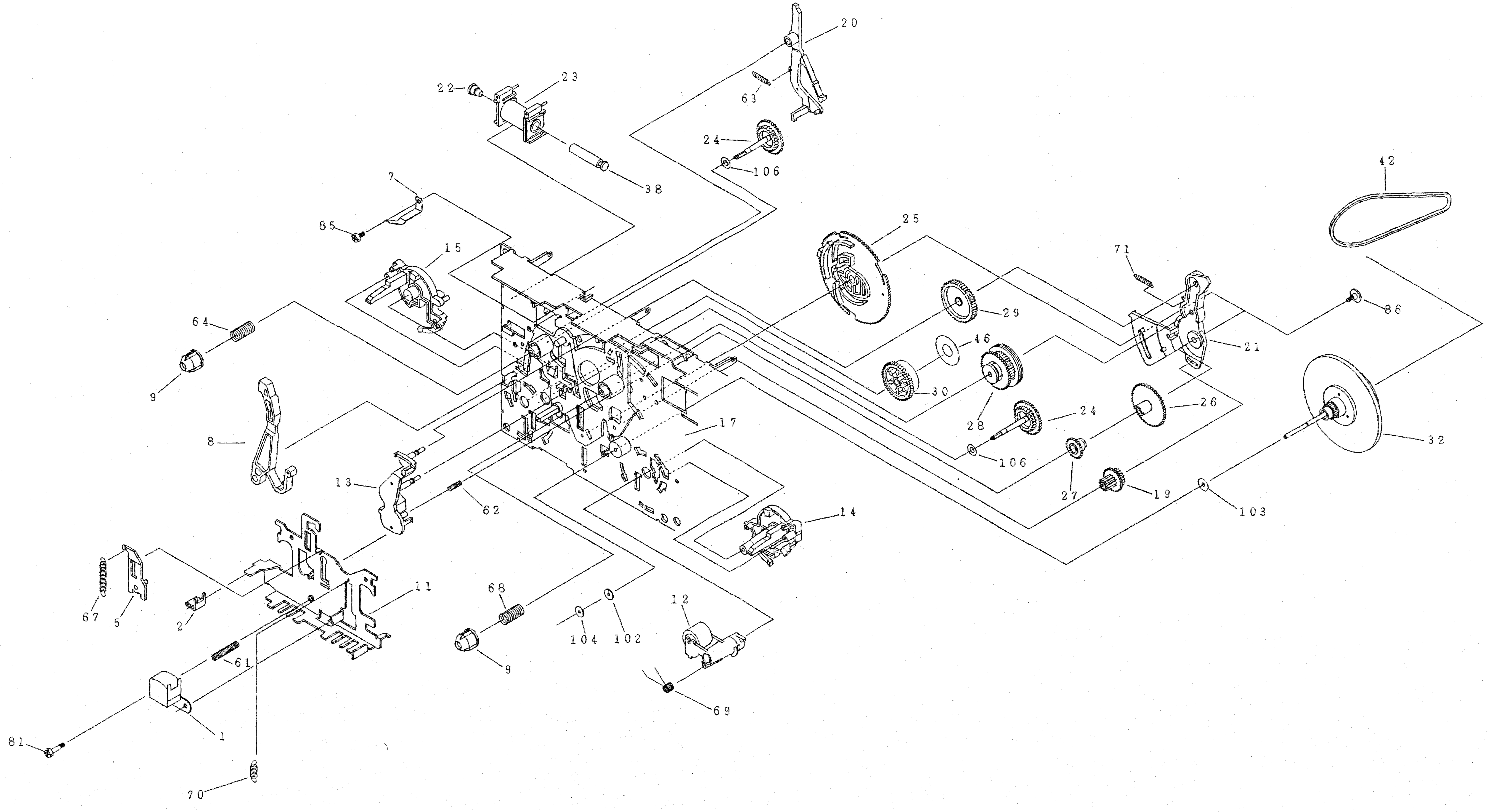
TAPE MECHANISM - MOTOR EXPLODED VIEW

1	4822 361 11055	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.


1
2
5
6
5
4
3
For Non - Autoreverse Mechanism

TAPE MECHANISM A - PLAY


20
23
22
63
24
106
38
42
7
85
25
15
71
29
86
64
46
21
9
30
26
28
24
8
17
32
106
13
62
27
19
103
14
11
68
12
67
5
2
104
102
9
61
69
1
81
70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
42	4822 358 10168	Belt AF
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.

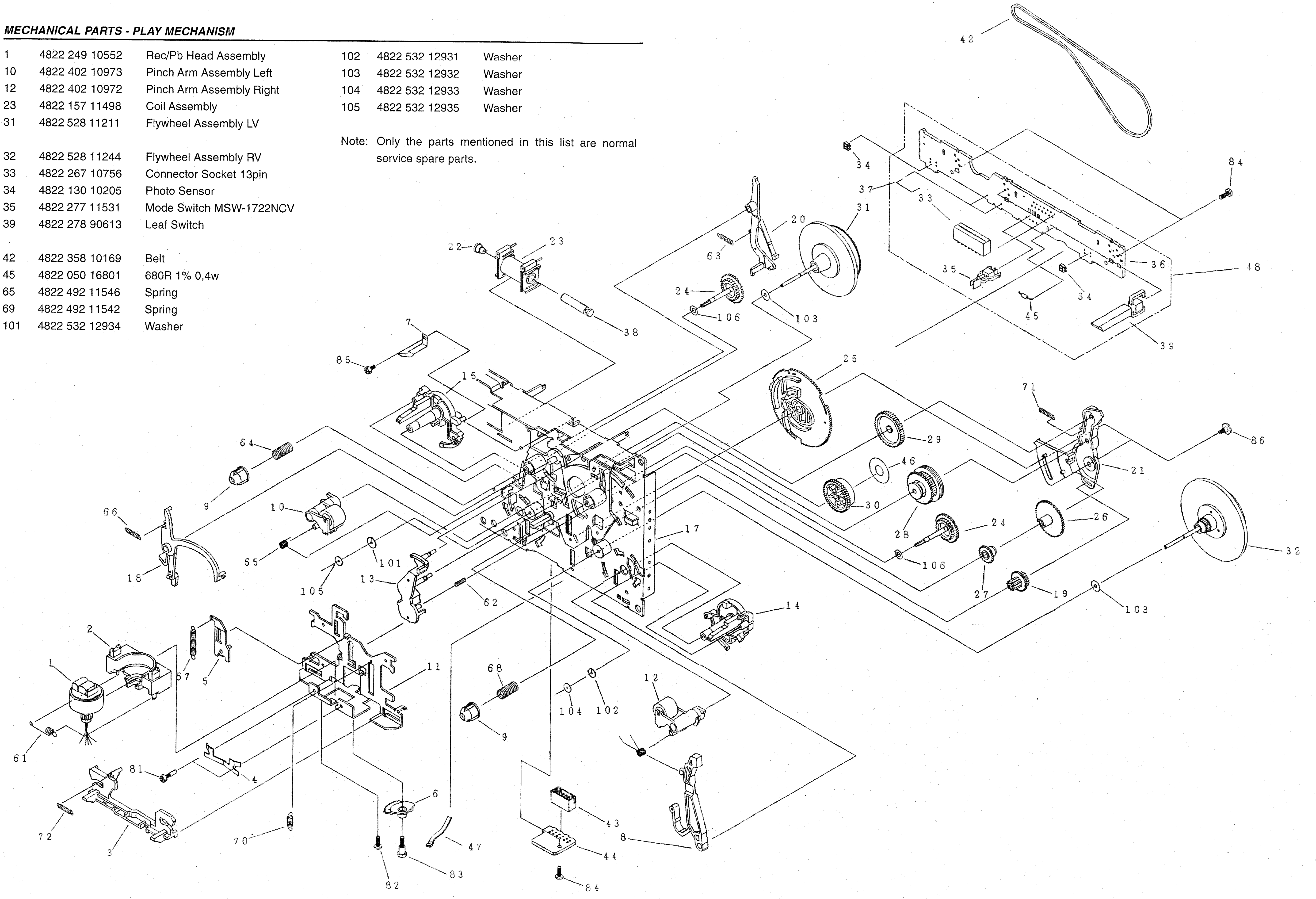
TAPE MECHANISM B - RECORD/PLAYBACK

(Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10552	Rec/Pb Head Assembly
10	4822 402 10973	Pinch Arm Assembly Left
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
31	4822 528 11211	Flywheel Assembly LV
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


42
34
84
37
33
31
20
63
36
48
35
34
45
39
22
23
24
106
103
38
7
85
15
25
71
86
29
46
21
64
9
30
28
24
26
32
66
10
17
18
65
101
105
13
62
106
27
19
103
14
2
1
67
5
11
68
104
102
12
9
61
81
4
6
72
3
70
47
43
8
44
82
83
84

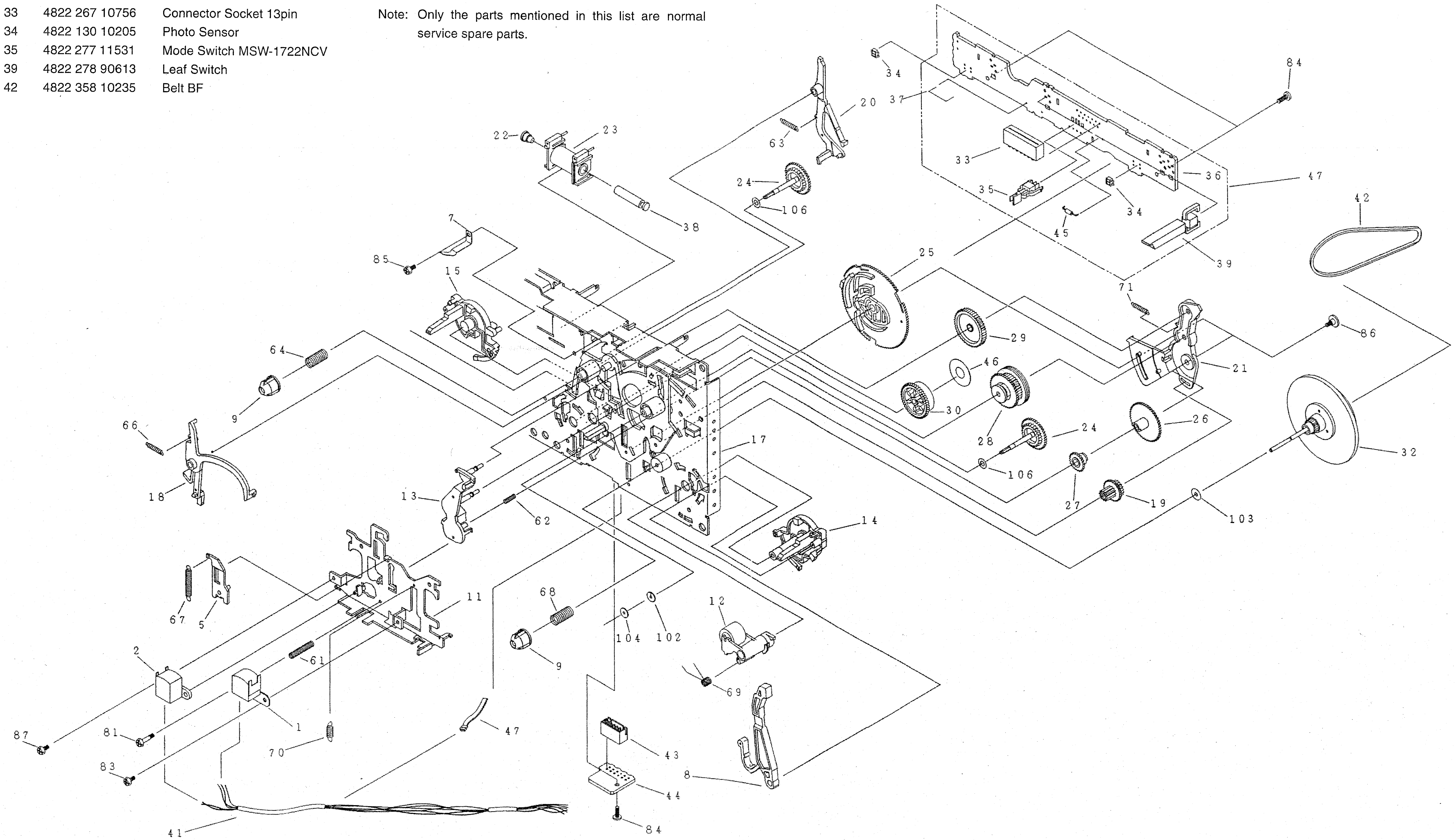
TAPE MECHANISM B - RECORD/PLAYBACK

(Non-Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	Rec/Pb Head Assembly
2	4822 249 40303	Erase Head
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10235	Belt BF
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


84
34
20
37
22
23
63
33
36
47
24
106
35
34
42
38
45
39
7
25
85
15
71
29
86
64
46
21
30
66
9
28
24
26
17
32
106
18
13
62
27
19
103
14
11
68
12
67
5
2
104
102
61
9
69
1
87
81
47
70
43
83
8
44
41
84

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

3709	4822 051 20688	6R8 5% 0,1W
3710	4822 051 20688	6R8 5% 0,1W
3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0,1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 1% 0,1W
3718	4822 117 11449	2k2 1% 0,1W
3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W *Autoreverse*
3723	4822 051 20153	15k 5% 0,1W *Non-Autoreverse*
3724	4822 117 11383	12k 1% 0,1W *Autoreverse*
3724	4822 051 20153	15k 5% 0,1W *Non-Autoreverse*
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0,1W
3732	4822 117 11507	6k8 1% 0,1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20223	22k 5% 0,1W
3741	4822 117 11449	2k2 1% 0,1W
3742	4822 117 11449	2k2 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3743	4822 051 10102	1k 2% 0,25W *Non-Autoreverse*
3744	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3744	4822 051 10102	1k 2% 0,25W *Non-Autoreverse*
3745	4822 051 20332	3k3 5% 0,1W
3746	4822 051 20332	3k3 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 117 13579	220k 1% 0,1W
3757	4822 117 13579	220k 1% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11383	12k 1% 0,1W *Autoreverse*
3769	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20472	4k7 5% 0,1W *Autoreverse*
3772	4822 051 20562	5k6 5% 0,1W *Non-Autoreverse*
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 117 10833	10k 1% 0,1W *Autoreverse*
3774	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688	⚠ 6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7P Vert.
1706	4822 267 10953	Flex Socket 7P Vert.
1770	4822 267 10738	Flex Socket 13P Vert.

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 13196	100nF 10% 25V
2625	4822 126 13196	100nF 10% 25V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	4822 122 33575	220pF 5% 50V
2706	4822 122 33575	220pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 40196	220µF 20% 16V
2716	4822 124 40196	220µF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 63V
2720	4822 126 12105	33nF 5% 63V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 34123	1nF 10% 50V
2728	5322 122 34123	1nF 10% 50V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13196	100nF 10% 25V
2737	4822 126 13196	100nF 10% 25V
2738	4822 126 13196	100nF 10% 25V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2744	4822 126 13196	100nF 10% 25V
2760	4822 126 13196	100nF 10% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40246	4,7µF 20% 63V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 117 10833	10k 1% 0,1W
3618	4822 117 10833	10k 1% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3701	4822 117 11503	220R 1% 0,1W
3702	4822 117 11503	220R 1% 0,1W
3703	4822 117 11503	220R 1% 0,1W
3704	4822 117 11503	220R 1% 0,1W
3705	4822 117 11503	220R 1% 0,1W
3706	4822 117 11503	220R 1% 0,1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

RESISTORS

4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4781	4822 051 20681	680R 5% 0,1W
4785	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805
4795	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Oscillator Coil 100kHz

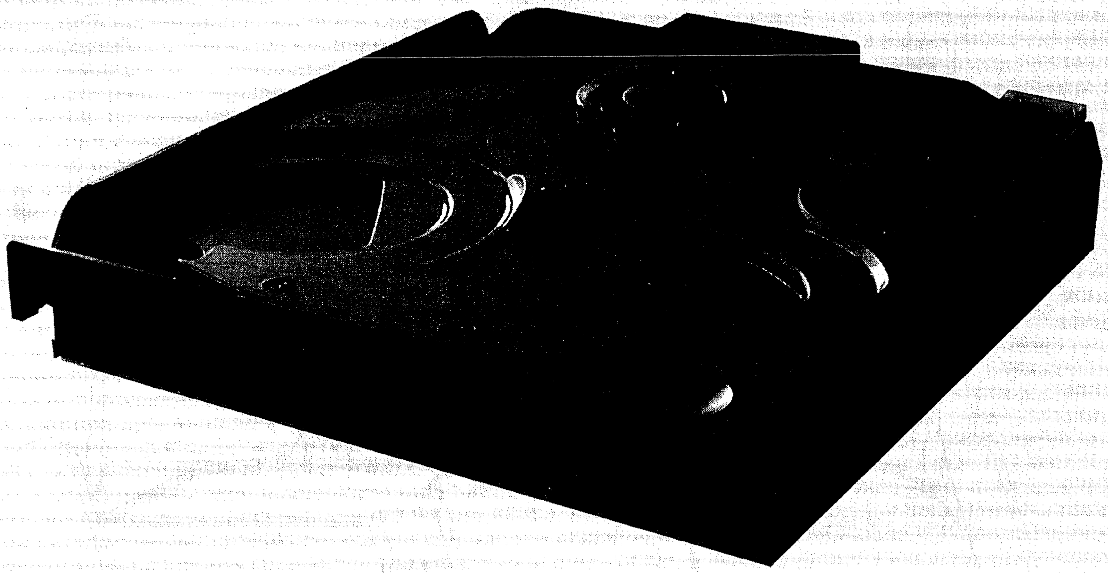
DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.



3CDC 99 Module

(3 Disc Carrousel Changer)

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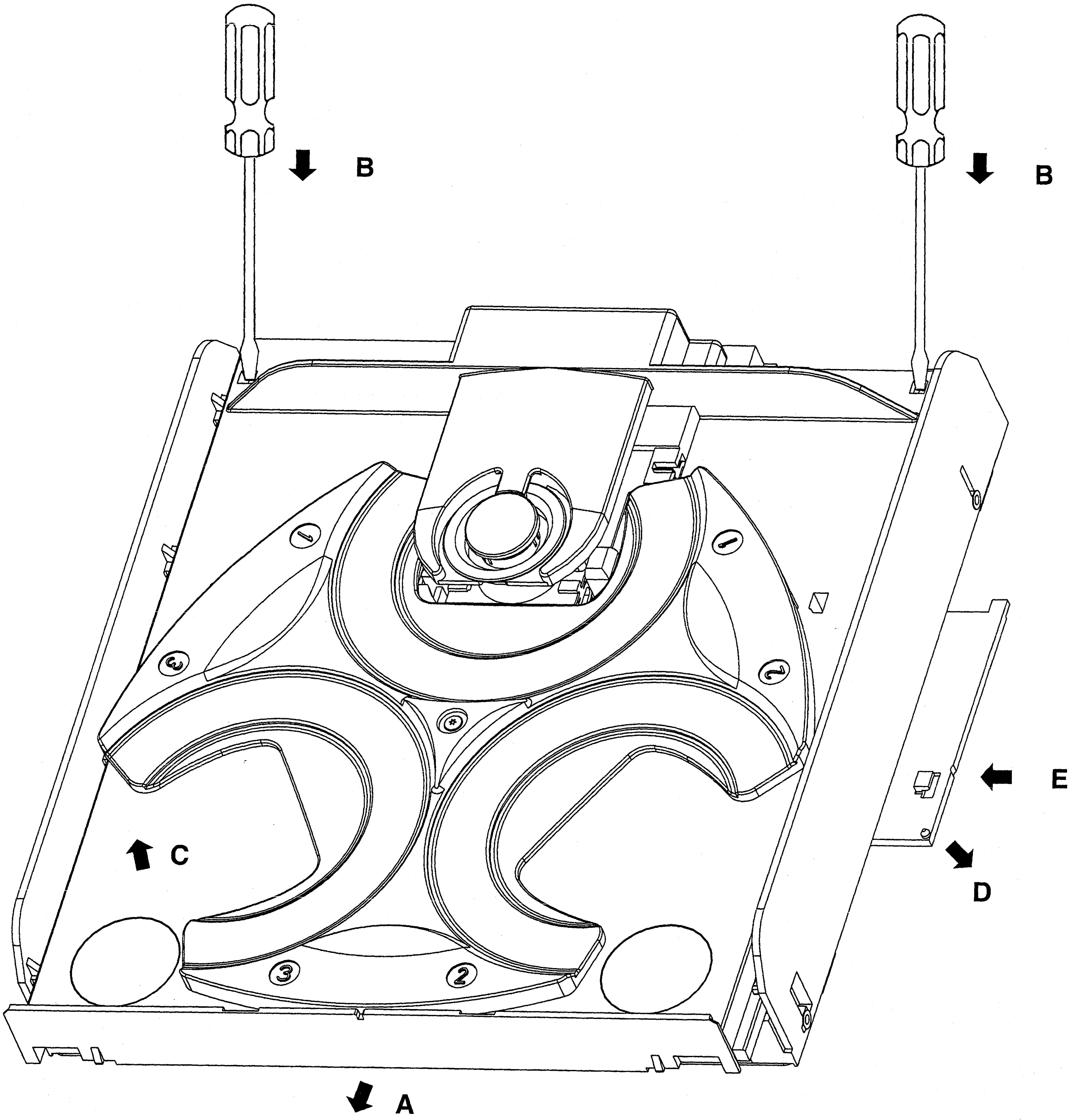
Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

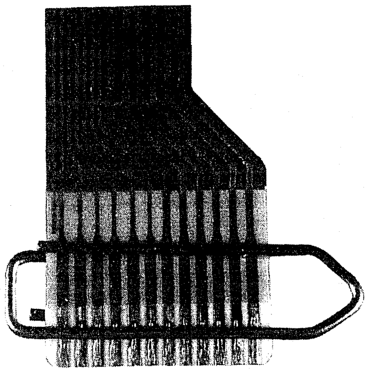
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

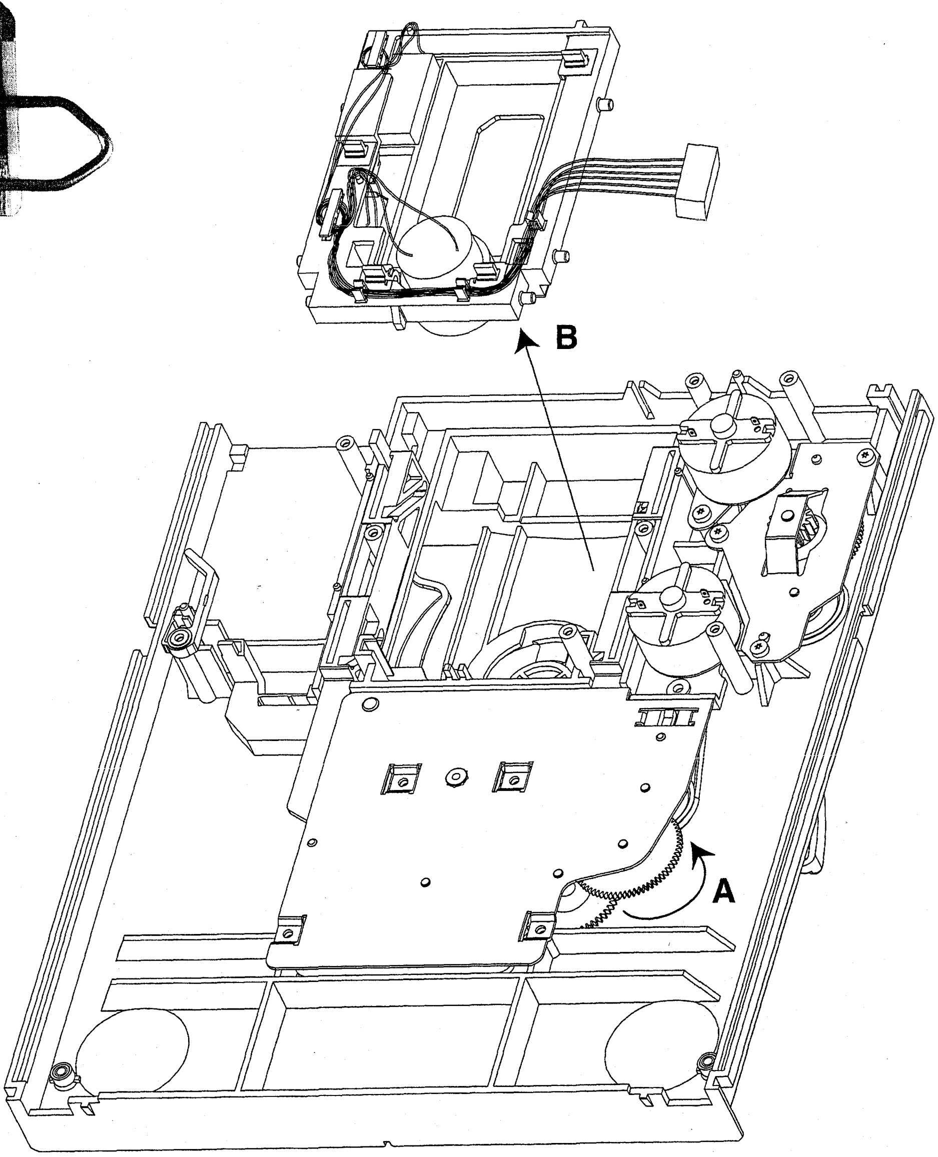
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount printed circuit board: remove 5 screws.
2. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
3. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
5. Demount CD drive support (pos 95) Ⓑ.
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

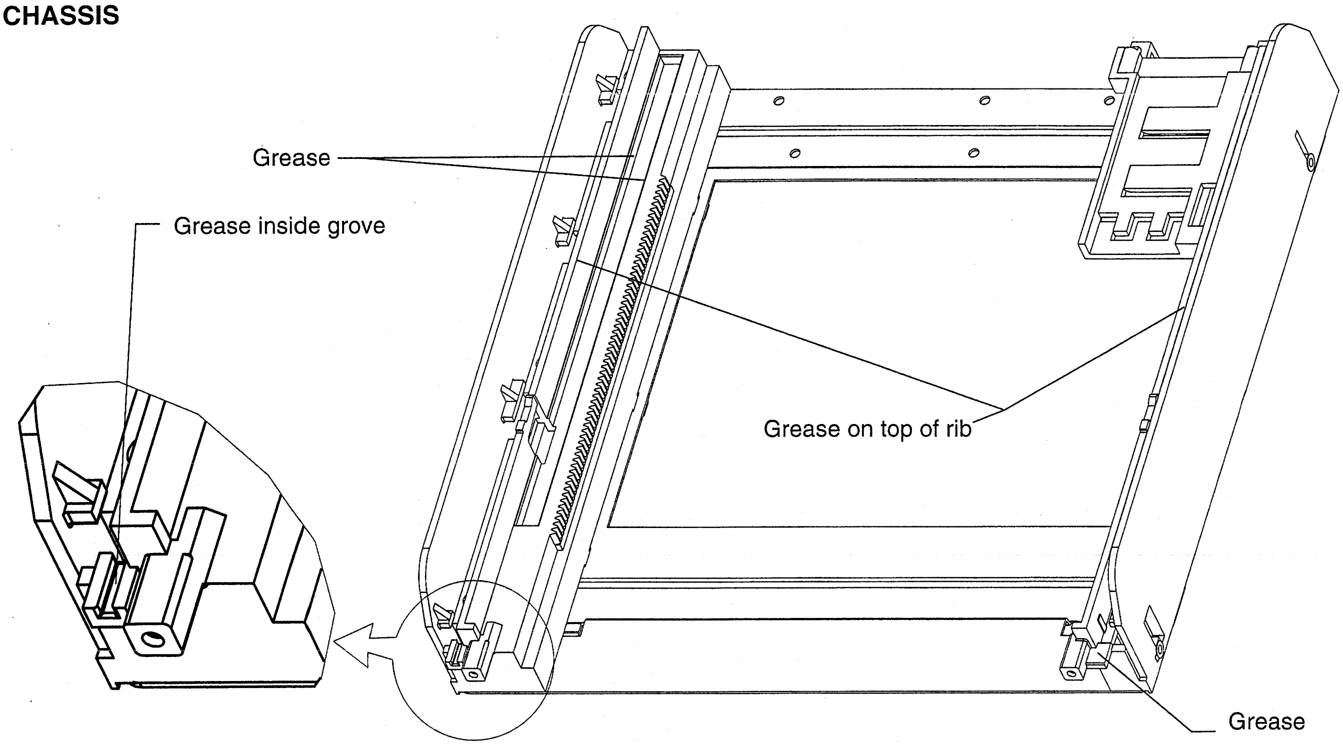


Mounting of Carrousel

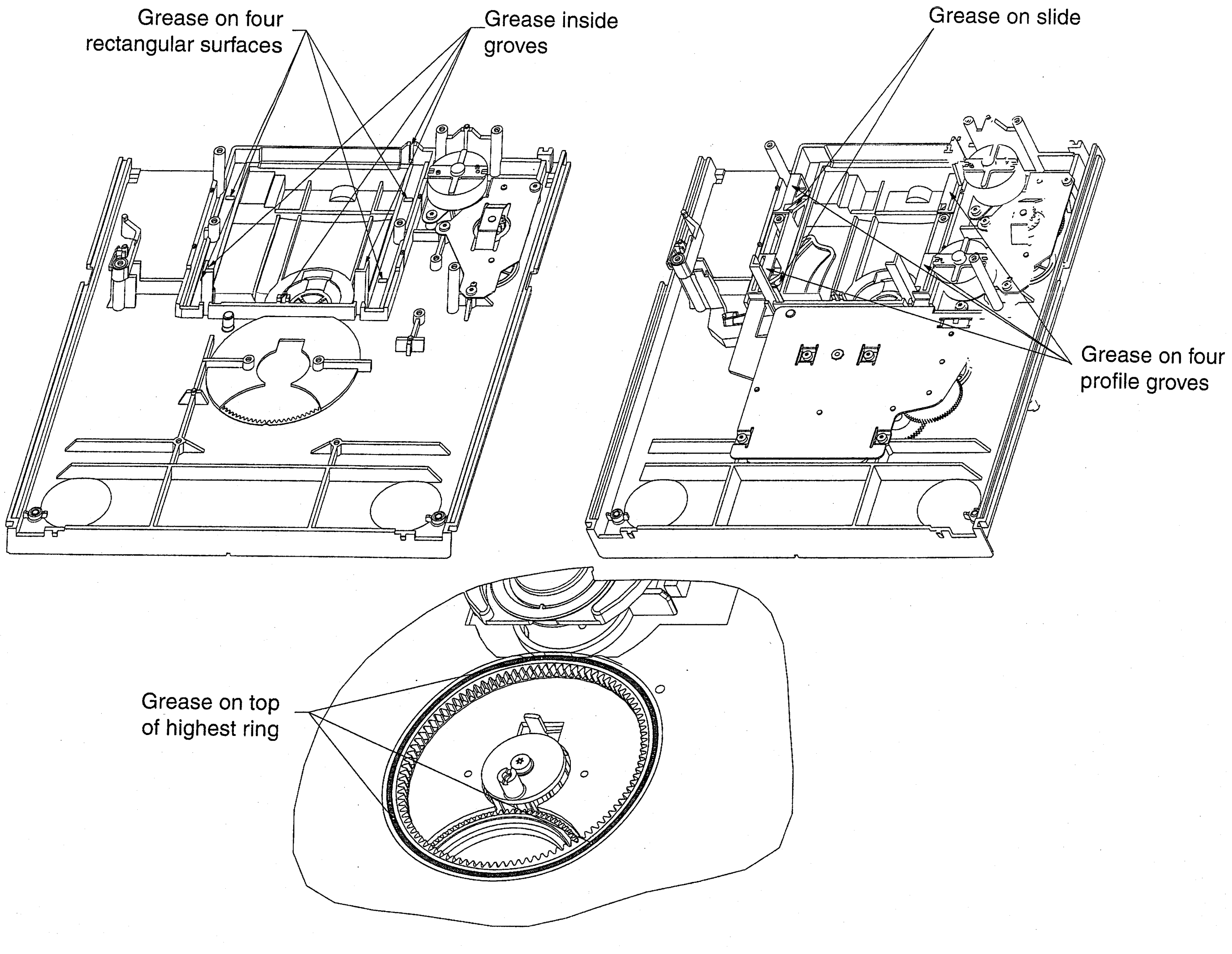
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

Lubrication Instructions

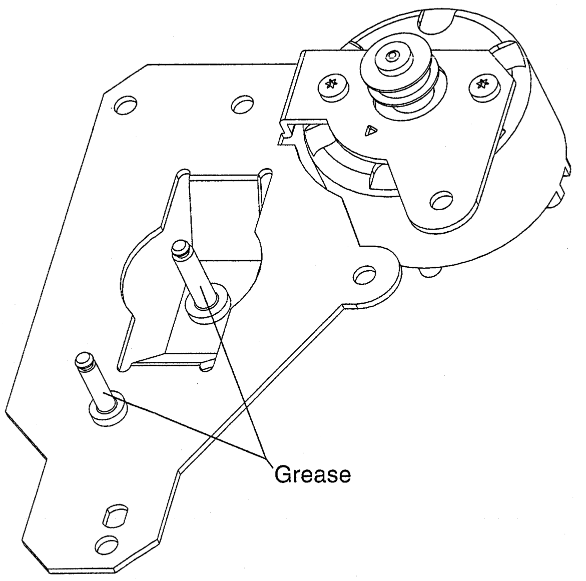
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

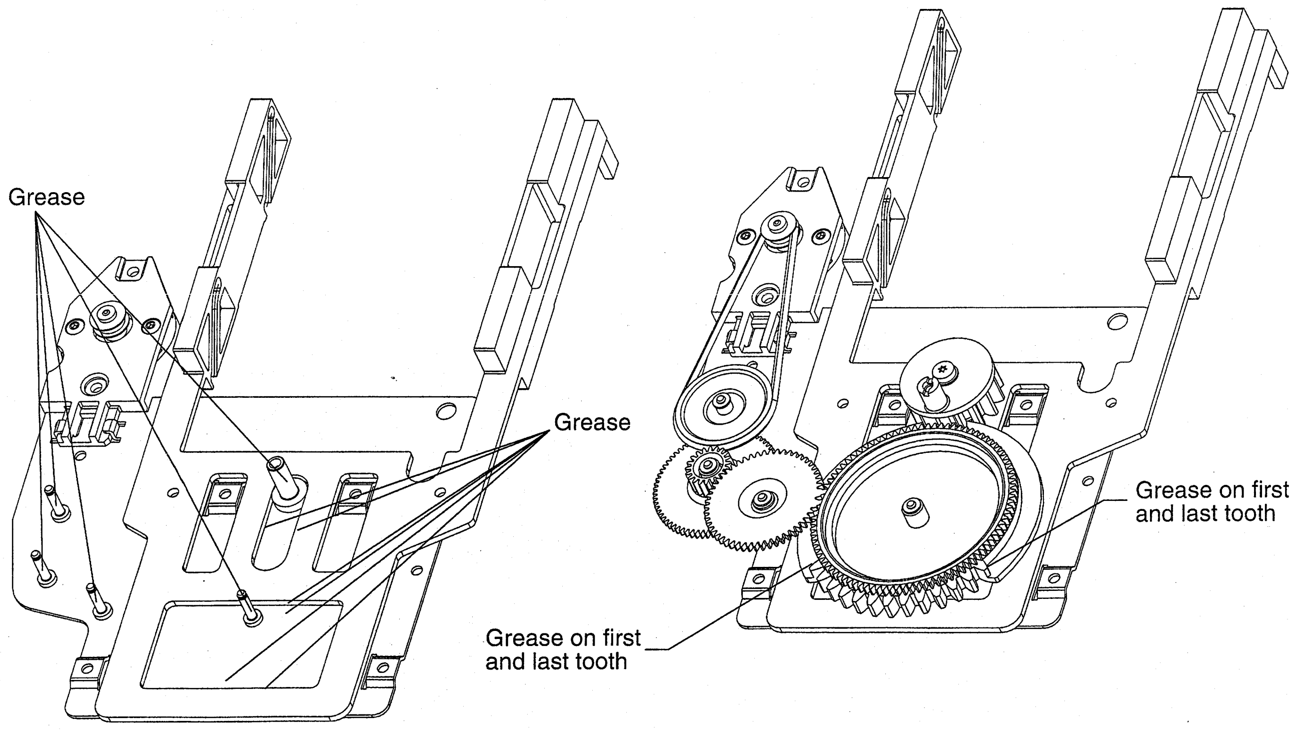
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE

- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

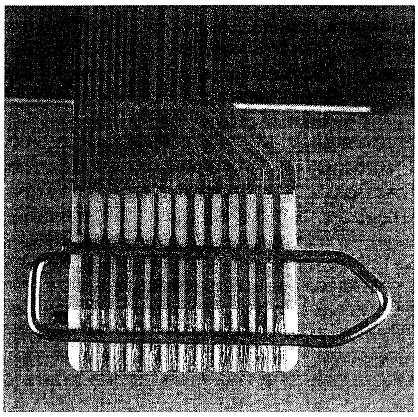


fig.1

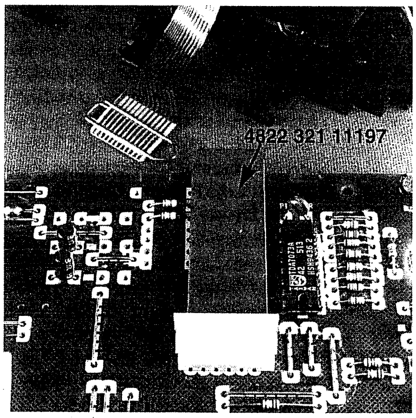


fig.2

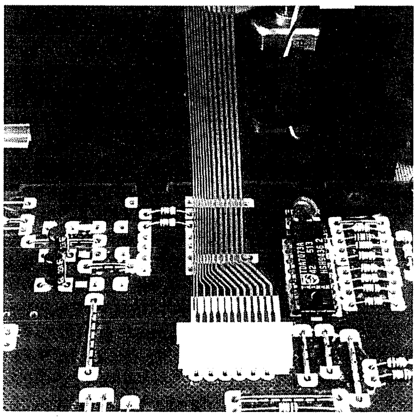
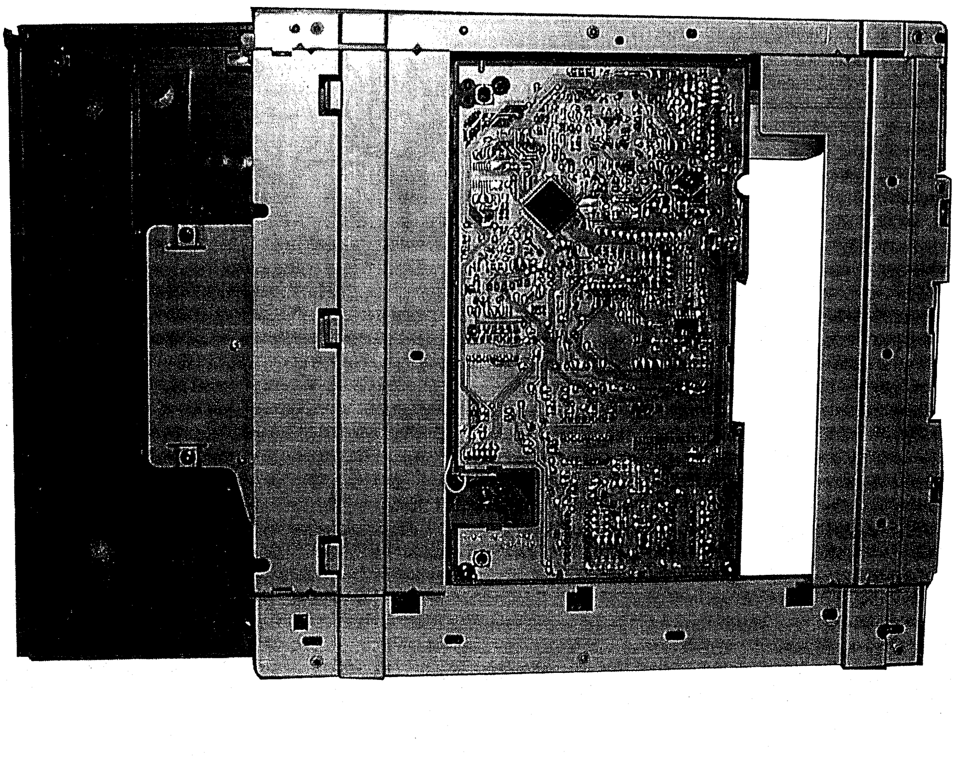
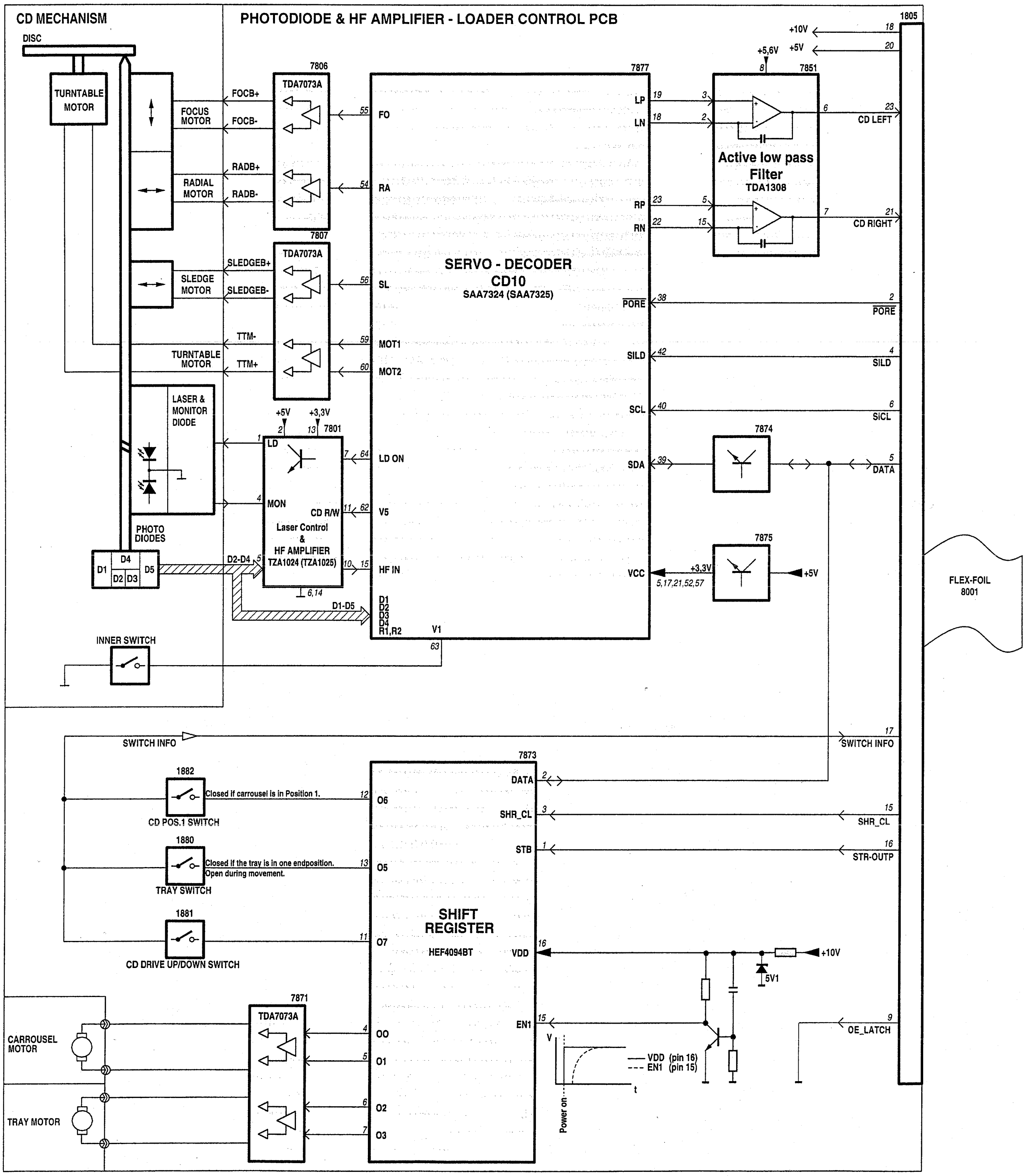


fig.3

Service Position

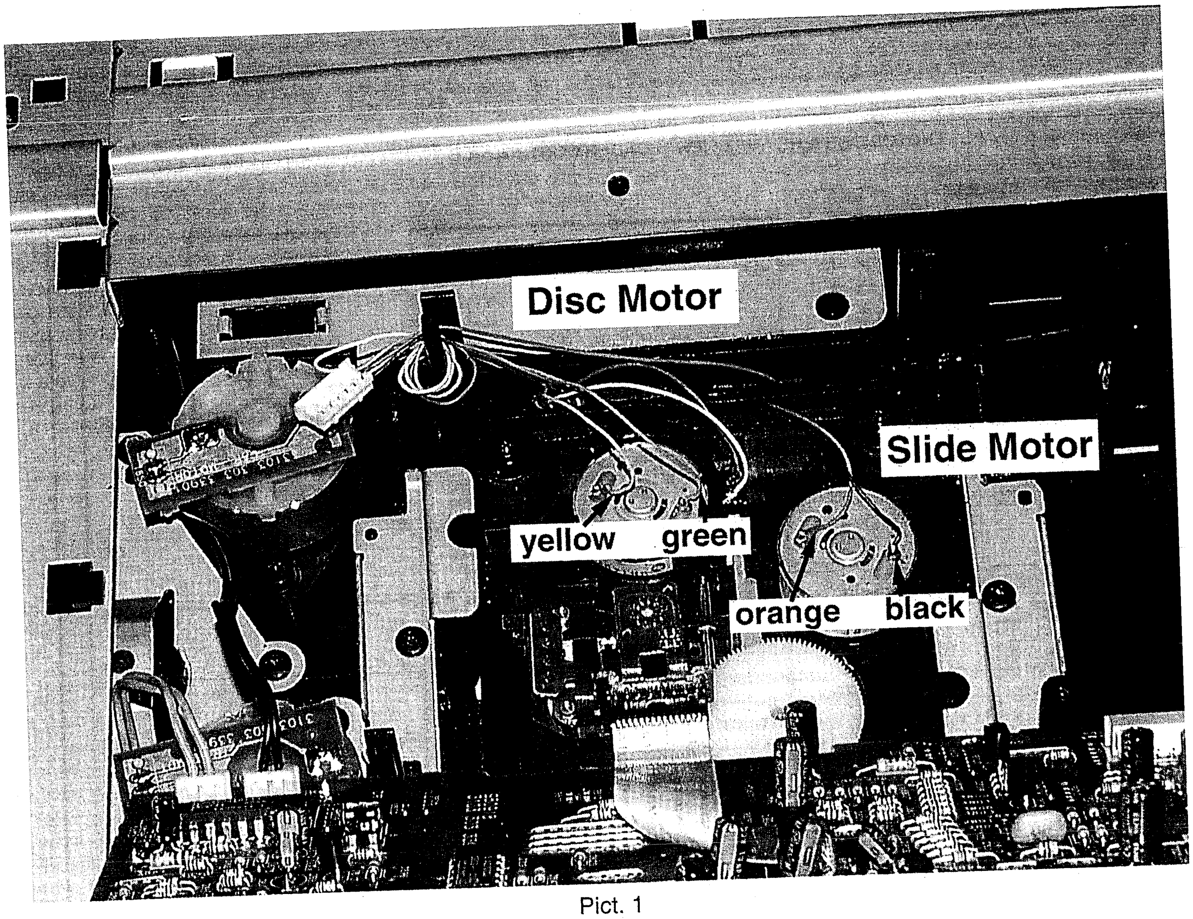


Blockdiagram

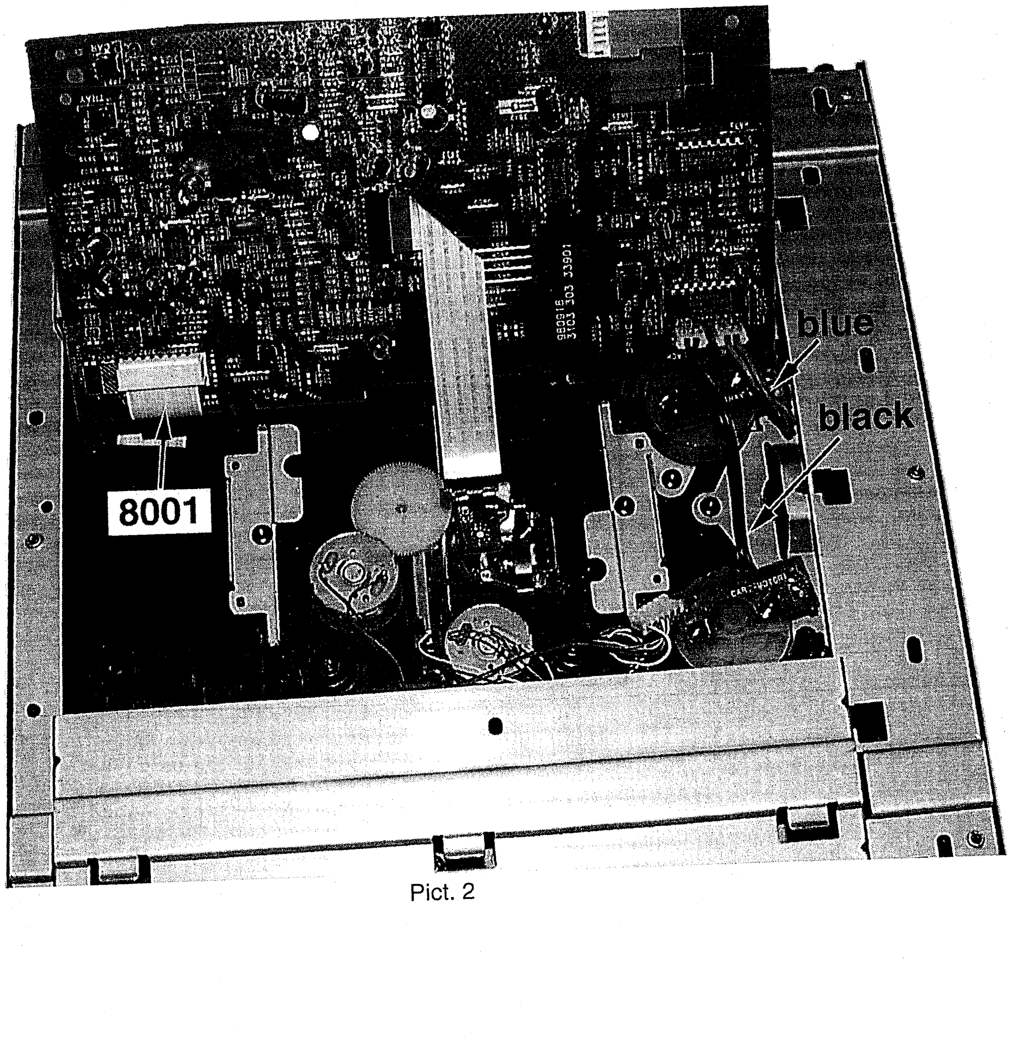

CD MECHANISM
DISC
TURNTABLE MOTOR
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
FOCUS MOTOR
FOCB+
FOCB-
RADIAL MOTOR
RADB+
RADB-
SLEDGE MOTOR
SLEDGEB+
SLEDGEB-
TURNTABLE MOTOR
TTM-
TTM+
7806
TDA7073A
7807
TDA7073A
LASER & MONITOR DIODE
PHOTO DIODES
D1
D2
D3
D4
D5
D2-D4
D1-D5
+5V
+3,3V
7801
LD
MON
CD R/W
Laser Control & HF AMPLIFIER TZA1024 (TZA1025)
6,14
INNER SWITCH
7877
FO
RA
SL
MOT1
MOT2
LD ON
V5
HF IN
D1 D2 D3 D4 R1,R2
V1
63
SERVO - DECODER
CD10
SAA7324 (SAA7325)
LP
LN
RP
RN
PORE
SILD
SCL
SDA
VCC
+3,3V
5,17,21,52,57
+5,6V
+5V
+10V
7851
Active low pass Filter
TDA1308
CD LEFT
CD RIGHT
PORE
SILD
SICL
DATA
7874
7875
+5V
1805
FLEX-FOIL 8001
SWITCH INFO
1882
CD POS.1 SWITCH
Closed if carrousel is in Position 1.
1880
TRAY SWITCH
Closed if the tray is in one endposition. Open during movement.
1881
CD DRIVE UP/DOWN SWITCH
7873
SHIFT REGISTER
HEF4094BT
O6
O5
O7
DATA
SHR_CL
STB
VDD
EN1
OO
O1
O2
O3
SHR_CL
STR-OUTP
OE_LATCH
+10V
5V1
V
t
Power on
VDD (pin 16)
EN1 (pin 15)
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

Blockdiagram 3CDC99 19981202

Wiring of CD Drive


Disc Motor
Slide Motor
yellow
green
orange
black

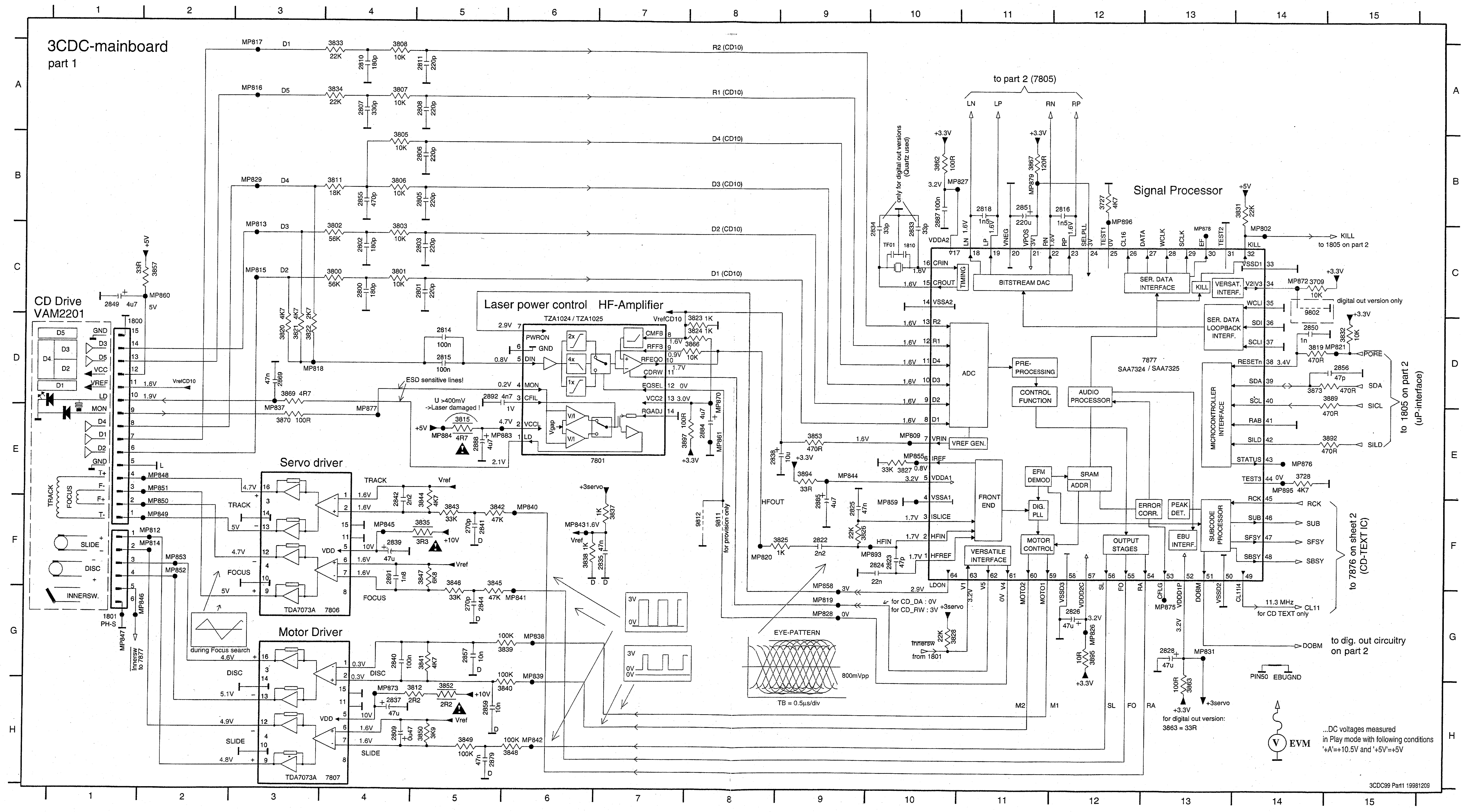
Pict. 1


blue
black
8001

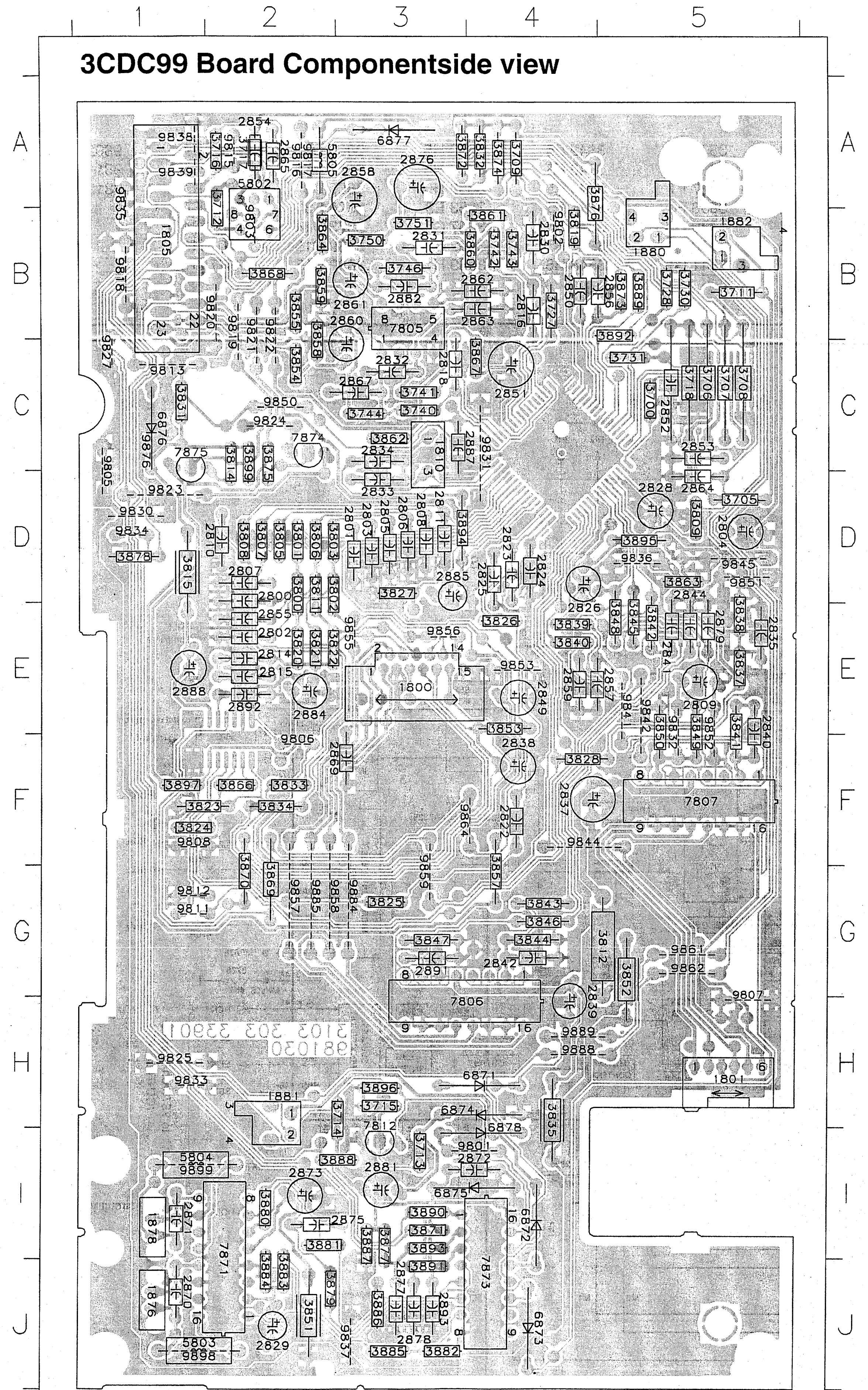
Pict. 2

1800 D2	2805 B5	2814 D5	2825 F9	2838 E8	2850 D14	2879 H5	2892 D5	3803 C4	3815 E5	3825 F9	3834 A4	3842 F5	3849 H5	3866 D8	3894 E9
1801 G1	2806 B5	2815 D5	2826 G12	2839 F4	2851 B11	2880 D8	3709 C14	3805 B4	3819 D14	3826 F9	3835 F5	3843 F5	3850 H5	3867 B11	3895 G12
1810 C10	2807 A4	2816 B12	2828 G13	2840 G4	2855 B4	2884 E8	3727 B12	3806 B4	3820 D3	3827 E10	3837 F7	3844 F5	3852 H5	3869 D3	3897 E7
2800 C4	2808 A5	2818 B11	2833 C10	2841 F5	2856 D15	2885 F9	3728 E14	3807 A4	3821 D3	3828 G10	3838 F6	3845 F5	3853 E9	3870 E3	7801 E7
2801 C5	2809 H4	2822 F9	2834 C10	2842 F4	2857 G5	2887 B10	3800 C4	3808 A4	3822 D3	3831 B14	3839 G6	3846 F5	3857 C2	3873 D14	7806 G4
2802 C4	2810 A4	2823 F10	2835 F7	2844 G5	2859 H5	2888 E5	3801 C4	3811 B4	3823 D8	3832 D15	3840 H6	3847 F5	3862 B10	3889 D15	7807 H4
2803 C5	2811 A5	2824 F10	2837 H4	2849 C1	2869 D3	2891 F4	3802 C4	3812 H5	3824 D8	3833 A4	3841 G5	3848 H6	3863 H13	3892 E15	7877 D12

9802 C14
9811 F8
9812 F8

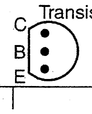

3CDC-mainboard
part 1
CD Drive
VAM2201
Laser power control HF-Amplifier
TZA1024 / TZA1025
7801
Servo driver
TDA7073A 7806
Motor Driver
TDA7073A 7807
Signal Processor
7877
SAA7324 / SAA7325
to part 2 (7805)
LN LP RN RP
BITSTREAM DAC
ADC
PRE-PROCESSING
CONTROL FUNCTION
AUDIO PROCESSOR
VREF GEN.
FRONT END
EFM DEMOD
SRAM
ADDR
DIG. PLL
MOTOR CONTROL
VERSATILE INTERFACE
OUTPUT STAGES
ERROR CORR.
PEAK DET.
EBU INTERF.
SUBCODE PROCESSOR
MICROCONTROLLER INTERFACE
SER. DATA INTERFACE
KILL
VERSAT. INTERF.
SER. DATA LOOPBACK INTERF.
TIMING
R2 (CD10)
R1 (CD10)
D4 (CD10)
D3 (CD10)
D2 (CD10)
D1 (CD10)
KILL
to 1805 on part 2
digital out version only
to 1805 on part 2 (uP-interface)
PORE
SDA
SICL
SILD
RCK
SUB
SFSY
SBSY
to 7876 on sheet 2 (CD-TEXT IC)
11.3 MHz
CL11
for CD TEXT only
DOBM
to dig. out circuitry on part 2
only for digital out versions (Quartz used)
ESD sensitive lines!
U >400mV ->Laser damaged !
for provision only
HFOUT
EYE-PATTERN
800mVpp
TB = 0.5μs/div
during Focus search
for CD_DA : 0V
for CD_RW : 3V
innersw from 1801
innersw to 7877
TRACK
FOCUS
SLIDE
DISC
INNERSW.
1801 PH-S
for digital out version: 3863 = 33R
PIN50 EBUGND
EVM
...DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V
3CDC99 Part1 19981209

3CDC99 Board Componentside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

Transistor pinning

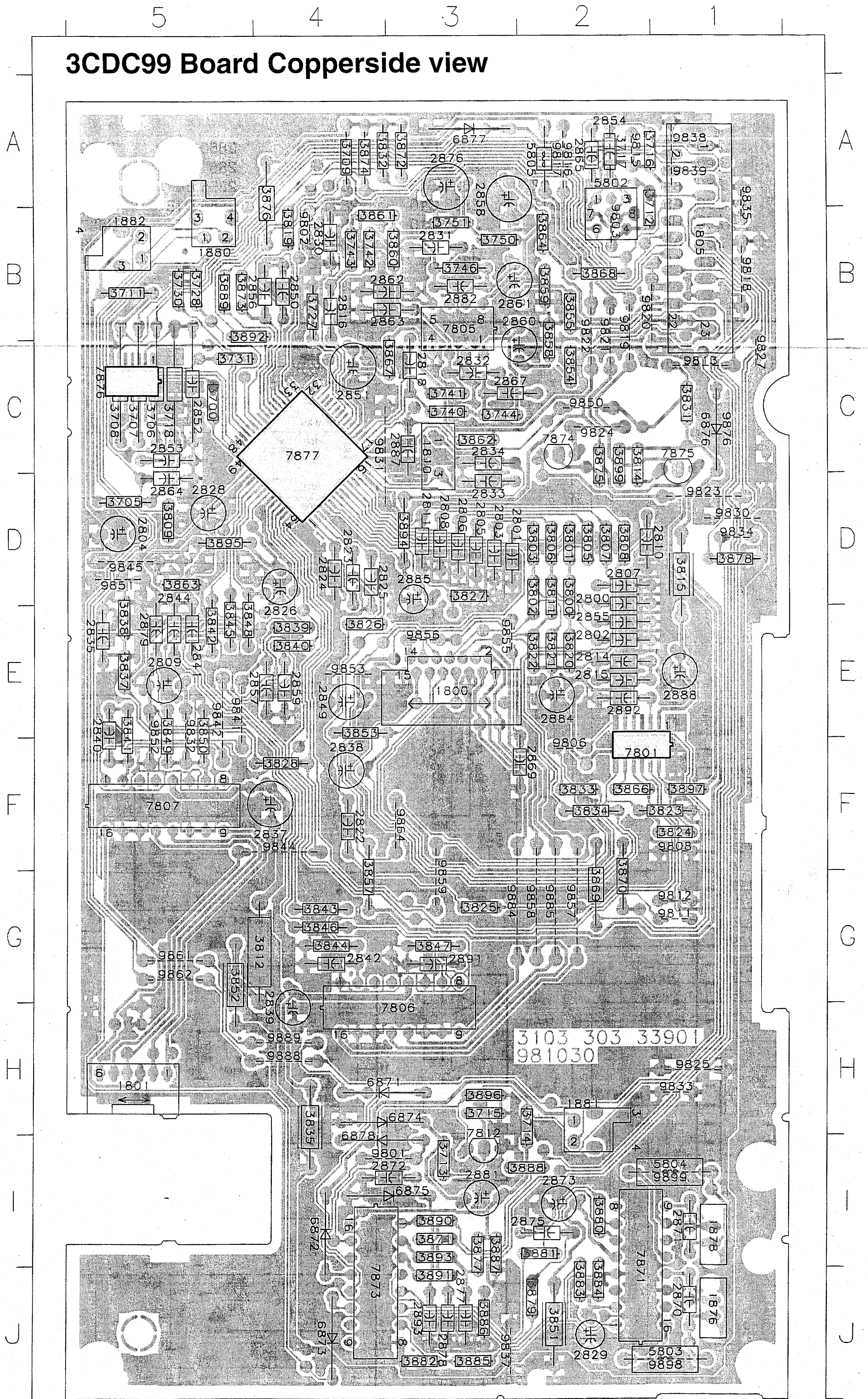


3CDC99 Layout stage .1 981205

Mapping

1800	E3
1801	H5
1805	B1
1810	C3
1876	J1
1878	I1
1880	B5
1881	H2
1882	B5
2800	D2
2801	D3
2802	E2
2803	D3
2804	D5
2805	D3
2806	D3
2807	D2
2808	D3
2809	E5
2810	D2
2811	D3
2814	E2
2815	E2
2816	B4
2818	C3
2822	F4
2823	D4
2824	D4
2825	D4
2826	E4
2828	D5
2829	J2
2830	B4
2831	B3
2832	C3
2833	D3
2834	C3
2835	E5
2837	F4
2838	F4
2839	H4
2840	E5
2841	E5
2842	G4
2844	D5
2849	E4
2850	B4
2851	C4
2852	C5
2853	C5
2854	A2
2855	E2
2856	B5
2857	E5
2858	A3
2859	E4
2860	B3
2861	B3
2862	B4
2863	B4
2864	D5
2865	A2
2867	C3
2869	F2
2870	J1
2871	I1
2872	I4
2873	I2
2875	I3
2876	A3
2877	J3
2878	J3
2879	E5
2881	I3
2882	B3
2884	E2
2885	D3
2887	C4
2888	E1
2891	G3
2892	E2
2893	J3
3700	C5
3705	D5
3706	C5
3707	C5
3708	C5
3709	A4
3711	B5
3712	B2
3713	I3
3714	H3
3715	H3
3716	A2
3717	A2
3718	C5
3727	B4
3728	B5
3730	B5
3731	C5
3740	C3
3741	C3
3742	B4
3743	B4
3744	C3
3746	B3
3750	B3
3751	B3
3800	D2
3801	D2
3802	D2
3803	D2
3805	D2
3806	D2
3807	D2
3808	D2
3809	D5
3811	D2
3812	G5
3814	C2
3815	D1
3819	B4
3820	E2
3821	E2
3822	E2
3823	F1
3824	F1
3825	G3
3826	E4
3827	D3
3828	F4
3831	C1
3832	A4
3833	F2
3834	F2
3835	H4
3837	E5
3838	E5
3839	E4
3840	E4
3841	E5
3842	E5
3843	G4
3844	G4
3845	E5
3846	G4
3847	G3
3848	E5
3849	E5
3850	E5
3851	J2
3852	G5
3853	E4
3854	C2
3855	B2
3857	G4
3858	C2
3859	B2
3860	B4
3861	B4
3862	C3
3863	D5
3864	B2
3866	F2
3867	C4
3868	B2
3869	G2
3870	G2
3871	I3
3872	A3
3873	B5
3874	A4
3875	C2
3876	A4
3877	I3
3878	D1
3879	J2
3880	I2
3881	I2
3882	J3
3883	J2
3884	J2
3885	J3
3886	J3
3887	I3
3888	I3
3889	B5
3890	I3
3891	J3
3892	B5
3893	I3
3894	D3
3895	D5
3896	H3
3897	F1
3899	C2
5802	A2
5803	J1
5804	I1
5805	A2
6871	H4
6872	I4
6873	J4
6874	H3
6875	I3
6876	C1
6877	A3
6878	H4
7801	F1
7805	B3
7806	H3
7807	F5
7812	H3
7871	J2
7873	J4
7874	C2
7875	C1
7876	C5
7877	C4
9801	I4
9802	B4
9803	B2
9805	D1
9806	F2
9807	G5
9808	F1
9811	G1
9812	G1
9813	C1
9815	A2
9816	A2
9817	A2
9818	B1
9819	B2
9820	B2
9821	B2
9822	B2
9823	D1
9824	C2
9825	H1
9827	C1
9830	D1
9831	C4
9832	E5
9833	H1
9834	D1
9835	A1
9836	D5
9837	J3
9838	A1
9839	A1
9841	E5
9842	E5
9844	F4
9845	D5
9850	C2
9851	D5
9852	E5
9853	E4
9855	E3
9856	E3
9857	G2
9858	G2
9859	G3
9861	G5
9862	G5
9864	F3
9876	C1
9884	G3
9885	G2
9888	H4
9889	H4
9898	J1
9899	I1

3CDC99 Board Copperside view



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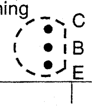
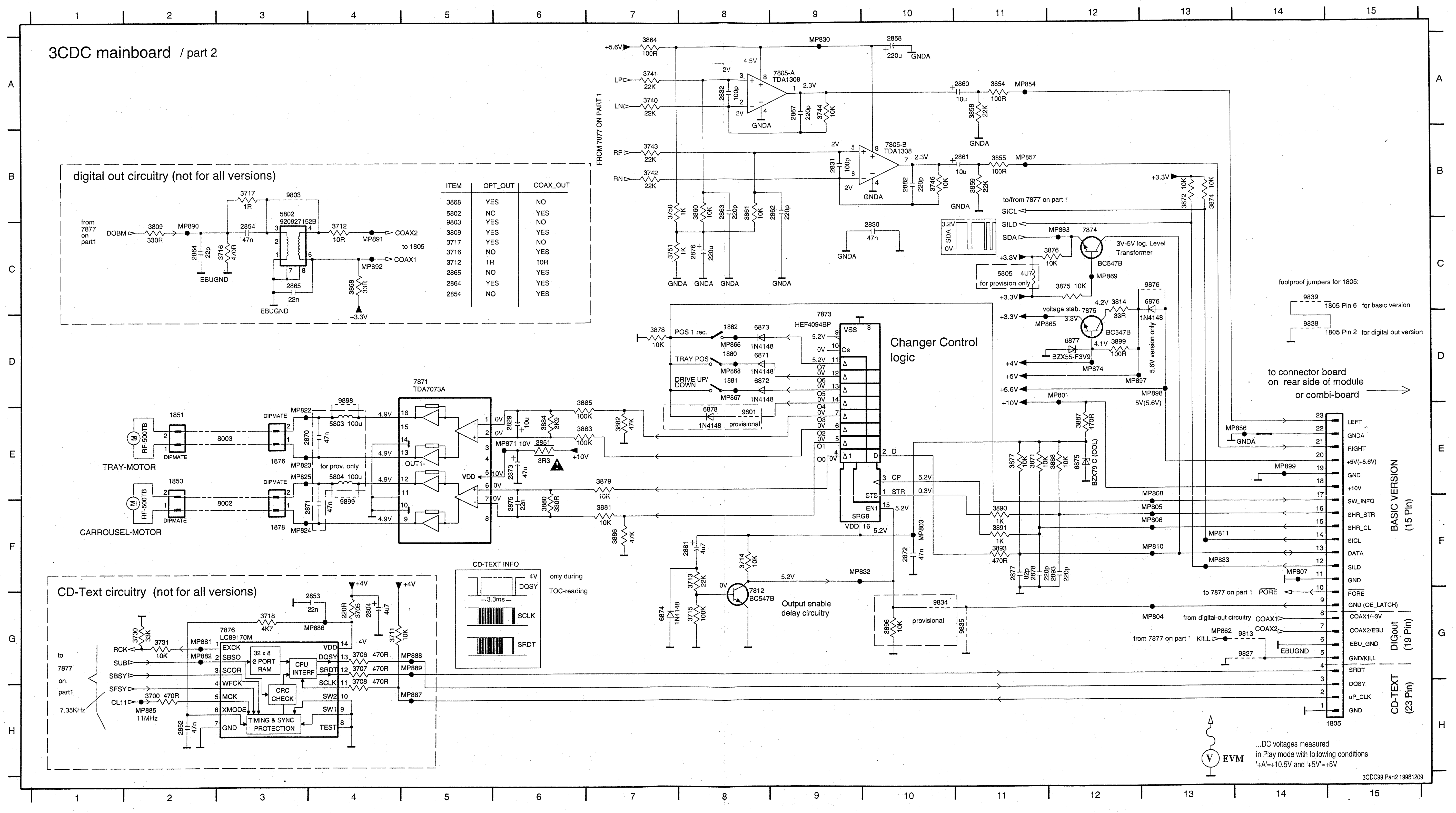
Transistor pinning

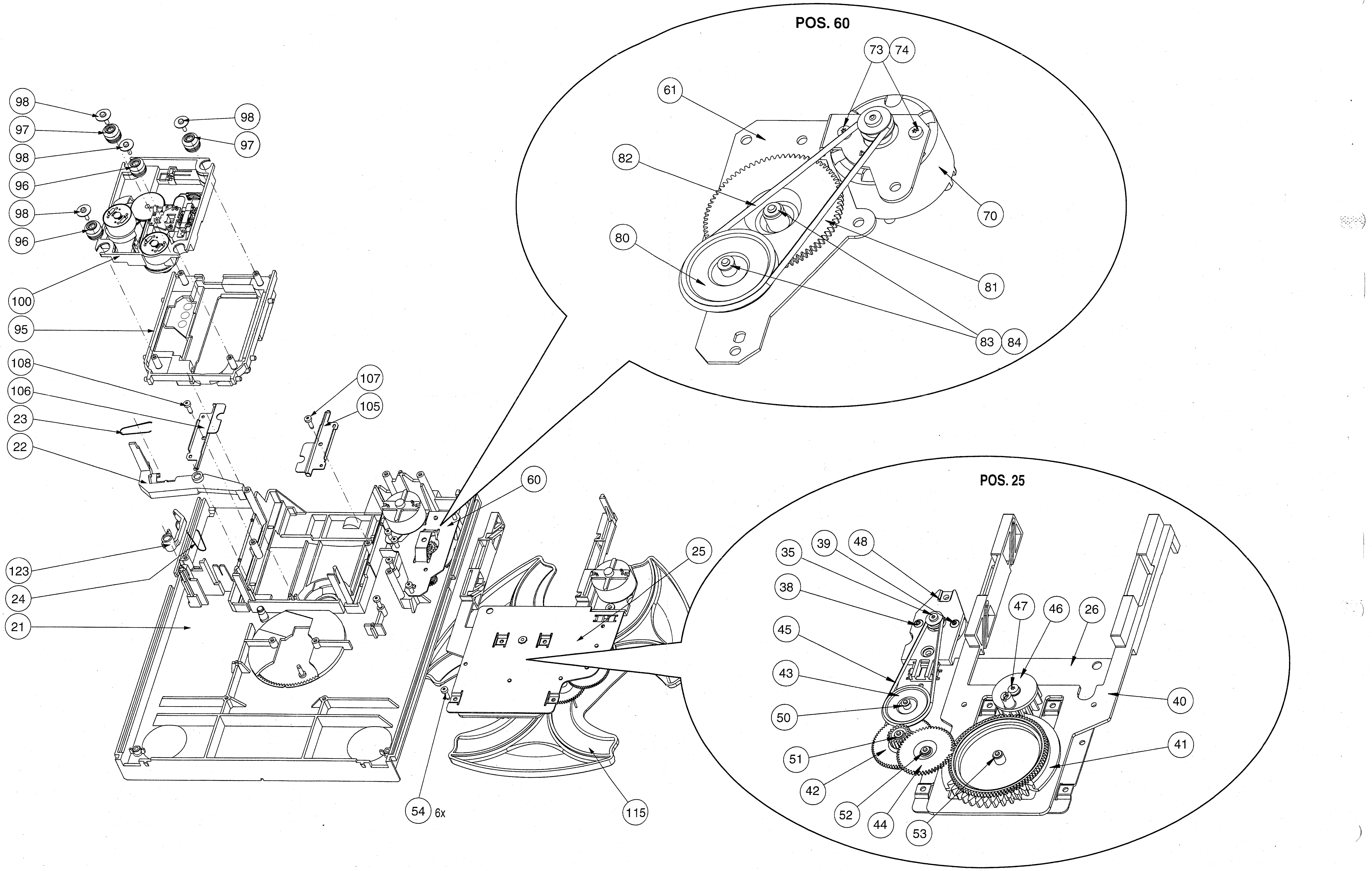


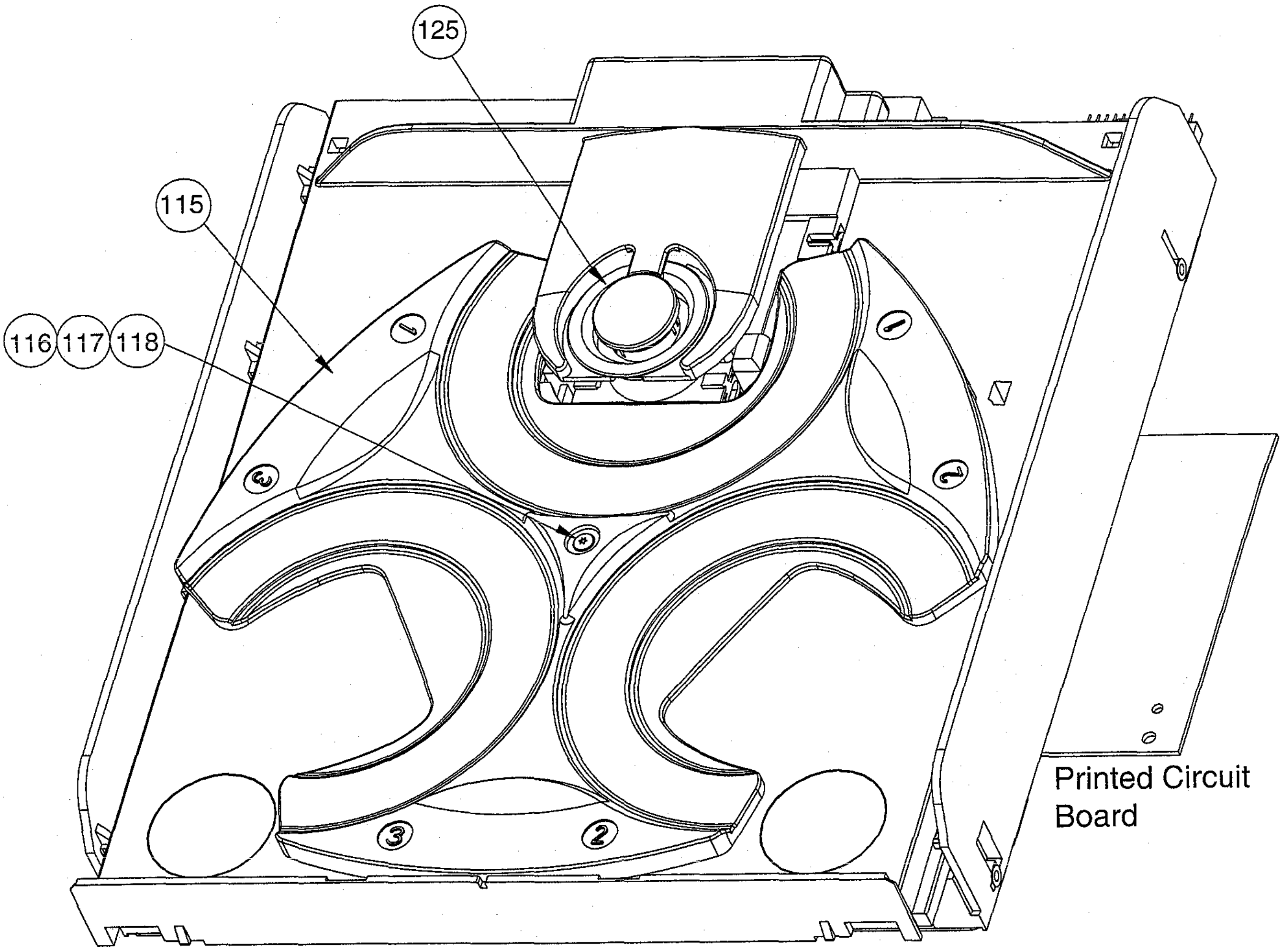
3CDC99 Layout stage .1 981205

1805	H14
1876	E3
1878	F3
1880	D8
1881	D8
1882	D8
2804	G4
2829	E6
2830	C10
2831	B9
2832	A8
2852	H2
2853	G4
2854	C3
2858	A10
2860	A11
2861	B11
2862	B8
2863	B8
2864	C2
2865	C3
2867	A9
2870	E3
2871	F4
2872	F10
2873	E6
2875	F6
2876	C8
2877	F11
2878	F11
2881	F8
2882	B10
2893	F12
3700	H2
3705	G4
3706	G4
3707	G4
3708	H4
3711	G4
3712	C4
3713	F8
3714	F8
3715	G8
3716	C3
3717	B3
3718	G3
3730	G2
3731	G2
3740	A7
3741	A7
3742	B7
3743	B7
3744	A9
3746	B10
3750	B7
3751	C7
3809	C2
3814	C12
3851	E6
3854	A11
3855	B11
3858	A11
3859	B11
3860	B8
3861	B8
3864	A7
3868	C4
3871	E11
3872	B13
3874	B13
3875	C12
3876	C12
3877	E11
3878	D7
3879	E7
3880	F6
3881	F7
3882	E7
3883	E6
3884	E6
3885	D6
3886	F7
3887	E12
3888	E12
3890	F11
3891	F11
3893	F11
3896	G10
3899	D12
5802	B3
5803	E4
5804	E4
5805	C11
6871	D8
6872	D8
6873	D8
6874	G7
6875	E12
6876	C13
6877	D12
6878	E8
7805-A	A9
7805-B	B10
7812	G8
7871	D5
7873	D9
7874	C12
7875	D12
7876	G3
9801	E8
9803	B3
9813	G14
9827	G14
9834	G10
9835	G11
9838	D14
9839	C14
9876	C13
9898	D4
9899	E4


3CDC mainboard / part 2
digital out circuitry (not for all versions)
CD-Text circuitry (not for all versions)
CD-TEXT INFO
only during TOC-reading
3.3ms
DQSY
SCLK
SRDT
Changer Control logic
7873 HEF4094BP
7871 TDA7073A
7805-A TDA1308
7805-B TDA1308
7876 LC89170M
32 x 8 2 PORT RAM
CPU INTERF
CRC CHECK
TIMING & SYNC PROTECTION
TRAY-MOTOR
CARROUSEL-MOTOR
RF-500TB
DIPMATE
FROM 7877 ON PART 1
to 7877 on part1
7.35KHz
11MHz
from 7877 on part1
DOBM
COAX2
COAX1
to 1805
EBUGND
POS 1 rec.
TRAY POS
DRIVE UP/ DOWN
provisional
for prov. only
for provision only
3V-5V log. Level Transformer
voltage stab.
5.6V version only
Output enable delay circuitry
to/from 7877 on part 1
SICL
SILD
SDA
foolproof jumpers for 1805:
1805 Pin 6 for basic version
1805 Pin 2 for digital out version
to connector board on rear side of module or combi-board
BASIC VERSION (15 Pin)
DIGout (19 Pin)
CD-TEXT (23 Pin)
LEFT
GNDA
RIGHT
+5V(+5.6V)
GND
+10V
SW_INFO
SHR_STR
SHR_CL
SICL
DATA
SILD
GND
PORE
GND (OE_LATCH)
COAX1/+3V
COAX2/EBU
EBU_GND
GND/KILL
SRDT
DQSY
uP_CLK
GND
to 7877 on part 1
from digital-out circuitry
from 7877 on part 1 KILL
EVM
...DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V
3CDC99 Part2 19981209

ITEM	OPT_OUT	COAX_OUT
3868	YES	NO
5802	NO	YES
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	1R	10R
2865	NO	YES
2864	YES	YES
2854	NO	YES

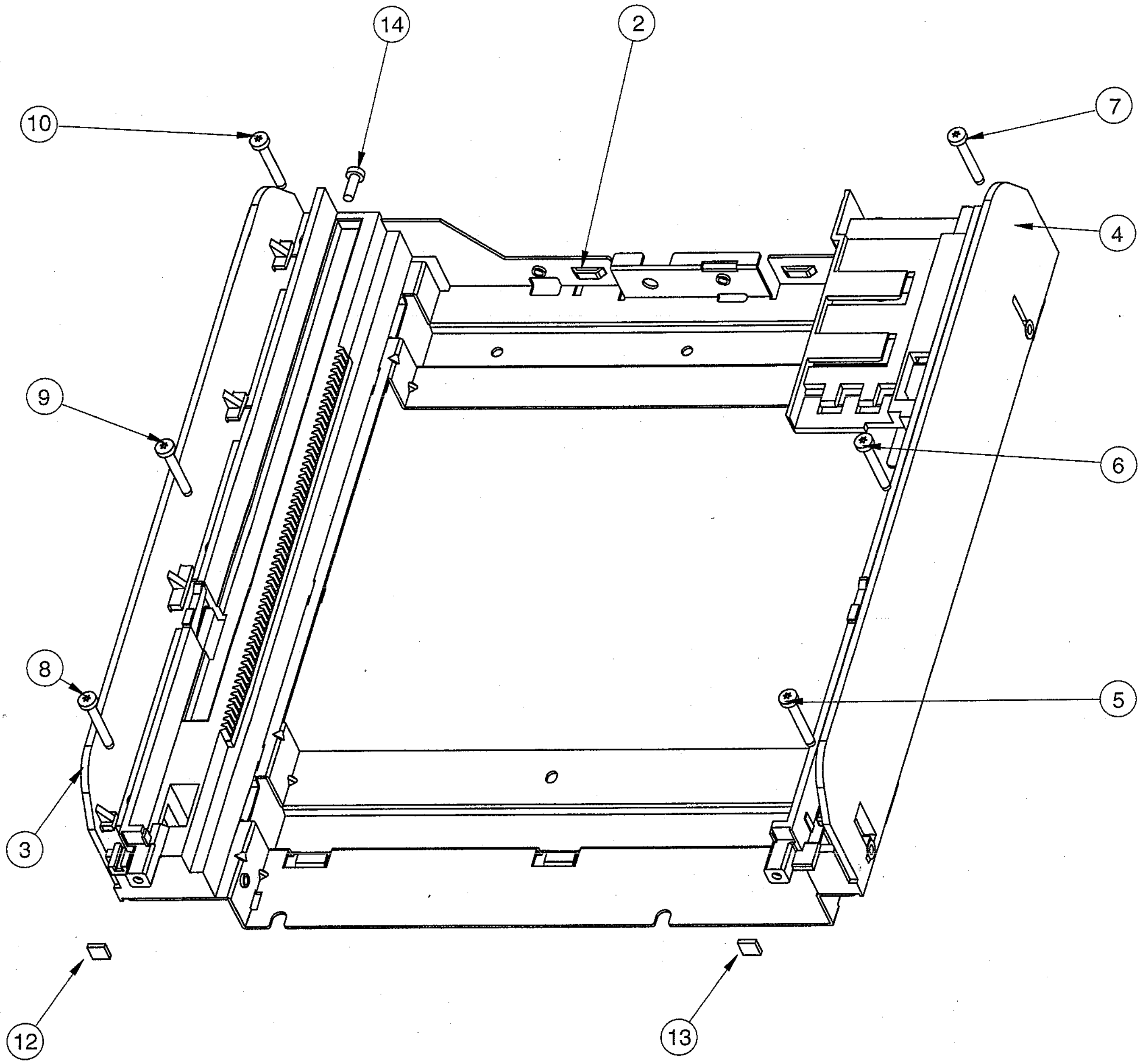

POS. 60
6x
POS. 25



MECHANICAL PARTSLIST 3CDC-99 MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)
3	4822 463 11008	GUIDE LEFT
4	4822 463 11009	GUIDE RIGHT
21	4822 441 11615	DRAWER
22	4822 402 10088	BRACKET TUMBLER
38	4822 502 12548	SCREW M2,6X3,5
39	4822 502 12548	SCREW M2,6X3,5
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTROL DISC
42	4822 522 10492	GEAR WHEEL
43	4822 528 10937	PULLEY
44	4822 522 10493	IDLER WHEEL
45	4822 358 10115	BELT
46	4822 466 10735	ECCENTRIC GEAR WHEEL
50	4822 532 12364	WASHER
51	4822 532 12364	WASHER
52	4822 532 12364	WASHER
53	4822 532 12364	WASHER
35	4822 361 10753	CARROUSEL MOTOR
70	4822 361 10753	CARROUSEL MOTOR

continued on next page



MECHANICAL PARTSLIST 3CDC-99 MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10895	SUPPORT
96	4822 529 10431	SUSPENSION
97	4822 529 10431	SUSPENSION
100	4822 691 10772	CD DRIVE VAM2201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
123	4822 402 11237	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP

ELECTRICAL PARTSLIST 3CDC-99 MODULE

MISCELLANEOUS

1800	4822 265 10925	FLEX FOIL CONNECTOR 15PIN
1805	4822 265 11533	FLEX FOIL CONNECTOR 23PIN
1805	4822 267 51322	FLEX FOIL CONNECTOR 15 PIN
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 124 40246	4,7µF	20%	63V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12787	330pF	10%	50V
2808	4822 122 10466	220pF	10%	50V
2809	5322 124 41948	0,47µF	20%	50V
2810	4822 126 10053	180pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2814	4822 126 12785	47nF	20%	50V
2815	4822 126 12882	100nF	20%	50V
2816	4822 126 12878	1,5nF	10%	16V
2818	4822 126 12878	1,5nF	10%	16V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12785	47nF	20%	50V
2826	4822 124 80231	47µF	20%	16V
2828	4822 124 40433	47µF	20%	25V
2829	4822 124 21732	10µF	20%	25V
2830	4822 126 12785	47nF	20%	50V
2831	4822 122 33195	100pF	10%	50V
2832	4822 122 33195	100pF	10%	50V
2833	4822 122 33069	33pF	5%	50V
2834	4822 122 33069	33pF	5%	50V
2835	4822 126 12785	47nF	20%	50V
2837	4822 124 40433	47µF	20%	25V
2838	4822 124 41579	10µF	20%	50V
2839	4822 124 40433	47µF	20%	25V
2840	4822 126 12882	100nF	20%	50V
2841	4822 126 12702	270pF	10%	50V
2842	4822 126 12339	2,2nF	10%	16V
2844	4822 126 12702	270pF	10%	50V
2849	4822 124 40246	4,7µF	20%	63V
2850	4822 122 33197	1nF	10%	50V
2851	4822 124 40196	220µF	20%	16V
2852	4822 126 12785	47nF	20%	50V
2853	4822 126 11585	22nF	20%	50V
2854	4822 126 12785	47nF	20%	50V
2855	4822 122 33519	470pF	10%	50V
2856	4822 122 33848	47pF	5%	50V
2857	4822 121 51387	10nF	20%	16V
2858	4822 124 40196	220µF	20%	16V
2859	4822 121 51387	10nF	20%	16V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 122 10466	220pF	10%	50V
2863	4822 122 10466	220pF	10%	50V
2864	4822 122 33191	22pF	5%	50V
2865	4822 126 11585	22nF	20%	50V
2867	4822 122 10466	220pF	10%	50V
2869	4822 126 12785	47nF	20%	50V

CAPACITORS

2872	4822 126 12785	47nF	20%	50V
2873	4822 124 12233	47µF	20%	25V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 40196	220µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 126 12785	47nF	20%	50V
2882	4822 122 10466	220pF	10%	50V
2884	4822 124 40246	4,7µF	20%	63V
2885	4822 124 40246	4,7µF	20%	63V
2887	4822 126 12882	100nF	20%	50V
2888	4822 124 40246	4,7µF	20%	63V
2891	4822 122 10576	1,8nF	10%	16V
2892	4822 126 11714	4,7nF	20%	16V
2893	4822 122 10466	220pF	10%	50V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 83872	220Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3709	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3712	4822 116 52176	10Ω	5%	0,5W
3713	4822 116 52257	22kΩ	5%	0,5W
3714	4822 116 83864	10kΩ	5%	0,5W
3715	4822 116 52234	100kΩ	5%	0,5W
3716	4822 116 83883	470Ω	5%	0,16W
3718	4822 116 52283	4,7kΩ	5%	0,5W
3727	4822 116 52283	4,7kΩ	5%	0,5W
3728	4822 116 52283	4,7kΩ	5%	0,5W
3730	4822 116 52271	33kΩ	5%	0,16W
3731	4822 116 83864	10kΩ	5%	0,5W
3740	4822 116 52257	22kΩ	5%	0,5W
3741	4822 116 52257	22kΩ	5%	0,5W
3742	4822 116 52257	22kΩ	5%	0,5W
3743	4822 116 52257	22kΩ	5%	0,5W
3744	4822 116 83864	10kΩ	5%	0,5W
3746	4822 116 83864	10kΩ	5%	0,5W
3750	4822 050 11002	1kΩ	5%	0,2W
3751	4822 050 11002	1kΩ	5%	0,2W
3800	4822 116 52291	56kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52291	56kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 83876	270Ω	5%	0.16W
3811	4822 116 52251	18kΩ	5%	0,5W
3812	4822 053 10228	2,2Ω	5%	1W
3814	4822 116 52191	33Ω	5%	0,5W
3815	4822 052 10478	4,7Ω	5%	NFR
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52283	4,7kΩ	5%	0,5W
3821	4822 116 52283	4,7kΩ	5%	0,5W
3822	4822 116 52249	1,8kΩ	5%	0,16W
3823	4822 050 11002	1kΩ	5%	0,2W
3824	4822 050 11002	1kΩ	5%	0,2W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52271	33kΩ	5%	0,16W

ELECTRICAL PARTSLIST 3CDC-99 MODULE

RESISTORS

3828	4822 116 52257	22kΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83864	10kΩ	5%	0,5W
3833	4822 116 52257	22kΩ	5%	0,5W
3834	4822 116 52257	22kΩ	5%	0,5W
3835	4822 052 10338	3,3Ω		NFR25
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52234	100kΩ	5%	0,5W
3840	4822 116 52234	100kΩ	5%	0,5W
3841	4822 116 52283	4,7kΩ	5%	0,5W
3842	4822 116 83884	47kΩ	5%	0,16W
3843	4822 116 52271	33kΩ	5%	0,16W
3844	4822 116 52283	4,7kΩ	5%	0,5W
3845	4822 116 83884	47kΩ	5%	0,16W
3846	4822 116 52271	33kΩ	5%	0,16W
3847	4822 116 83961	6,8kΩ	5%	0,16W
3848	4822 116 52234	100kΩ	5%	0,5W
3849	4822 116 52234	100kΩ	5%	0,5W
3850	4822 116 52276	3,9kΩ	5%	0,5W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 116 83883	470Ω	5%	0,16W
3854	4822 116 52175	100Ω	5%	0,5W
3855	4822 116 52175	100Ω	5%	0,5W
3857	4822 116 52191	33Ω	5%	0,5W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83864	10kΩ	5%	0,5W
3861	4822 116 83864	10kΩ	5%	0,5W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52191	33Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3866	4822 116 83864	10kΩ	5%	0,5W
3867	4822 116 83868	150Ω	5%	0,5W
3869	4822 050 24708	4,7Ω	1%	0,6W
3870	4822 116 52175	100Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83864	10kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 116 83883	470Ω	5%	0,16W
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W
3892	4822 116 83883	470Ω	5%	0,16W
3893	4822 116 83883	470Ω	5%	0,16W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3897	4822 116 52175	100Ω	5%	0,5W
3899	4822 116 52175	100Ω	5%	0,5W

COILS

1810	4822 242 10849	QUARTZ 8,46MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5802	4822 156 31058	FILTER DIGITAL OUT

DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1
6877	4822 130 31981	BZX79-C3V9

TRANSISTORS

7812	4822 130 40959	BC547B
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7801 ©	4822 209 17286	TZA1024T/N1 HF-AMPLIFIER
7805	4822 209 17284	TDA1308 OPAMP
7806	4822 209 32852	TDA7073A/N2 SERVO DRIVER
7807	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7871	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7873	5322 209 10421	HEF4094BP SHIFT REGISTER
7876 ©	4822 209 16143	LC89170M CD TEXT
7877 ©	4822 209 17285	SAA7324H/M1 SIGNAL PROCESSOR

COMBI BOARD

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Brief introduction of the Combi Board

A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +12A, +12M, -26V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the µP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes , DBB, IS and CD_ON. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the µP on the Front board.

b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to th e selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (BC557B or ON4986) and PWM control signal from µP. For good performance transistors for the left and right channels should be paired for gain characteristics.

d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069BT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

f) CD ON CONTROL

This circuit switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

D. KARAOKE & HEADPHONE PART

a) SIMPLE KARAOKE

This is a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

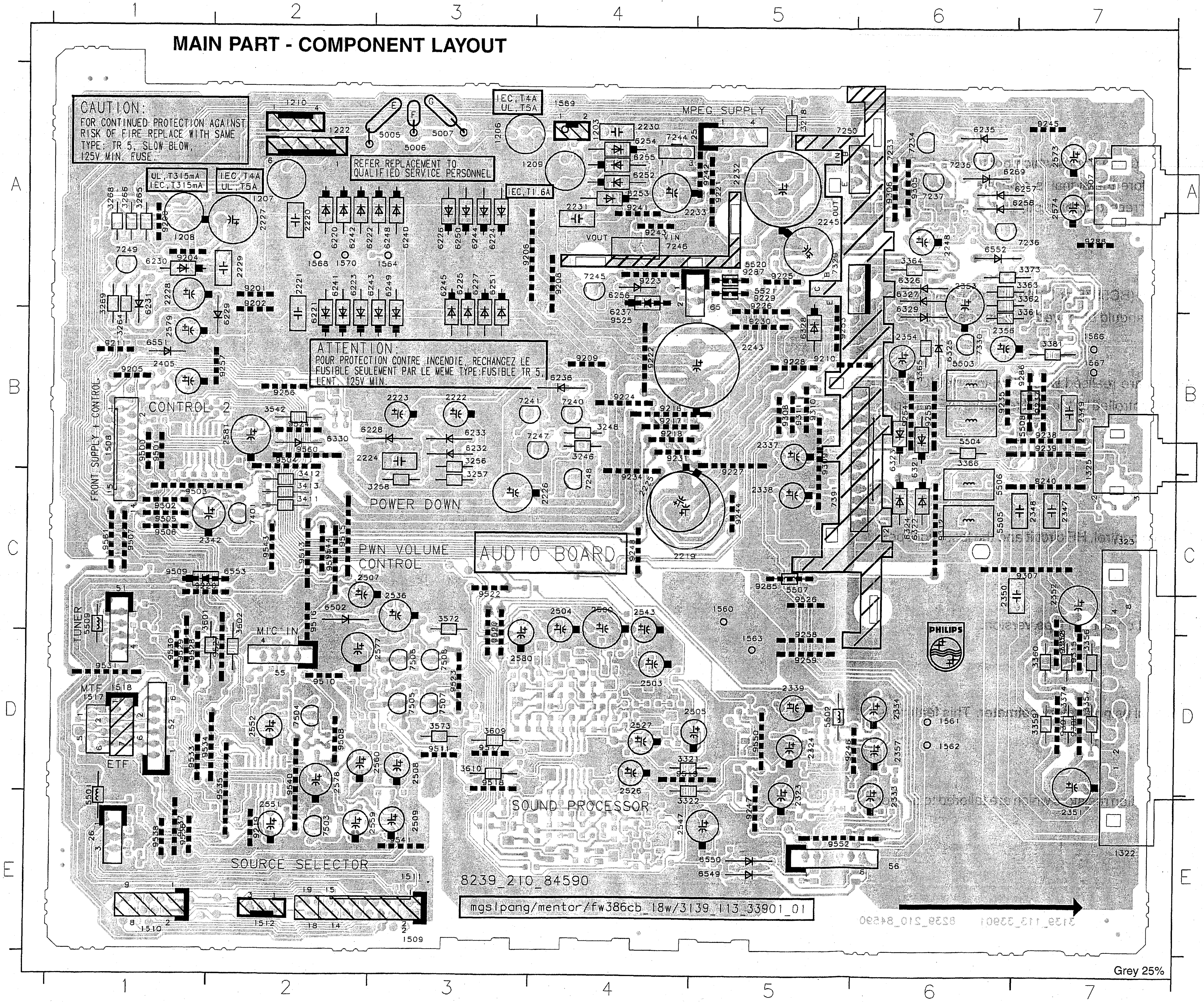
g) HEADPHONE OUTPUT

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

25	A4	1509	E3	2222	B3	2337	B5	2507	C2	3218	A5	3362	A7	5006	A3	6226	A3
26	E1	1510	E1	2223	B3	2338	C5	2508	D3	3246	B4	3363	A7	5007	A3	6227	A3
51	C1	1511	E3	2224	B2	2339	D5	2509	E3	3248	B4	3364	A6	5501	E1	6228	B2
52	D1	1512	E2	2225	C4	2342	C1	2526	D4	3256	B3	3365	B6	5502	D5	6229	B2
55	D2	1517	D1	2226	C4	2347	C7	2527	D4	3257	C3	3366	B6	5503	B6	6230	A1
56	E6	1518	D1	2227	A2	2348	C7	2536	C3	3258	C3	3373	A7	5504	B6	6231	A1
65	A5	1560	C5	2228	A1	2349	B7	2543	C4	3264	B1	3374	D7	5505	C6	6232	B3
1203	A4	1561	D6	2229	A2	2350	C6	2547	E4	3265	A1	3381	B7	5506	C6	6233	B3
1206	A3	1562	D6	2230	A4	2351	E7	2551	E2	3266	A1	3411	C2	5507	C5	6235	A6
1207	A2	1563	D5	2231	A4	2352	C7	2552	D2	3268	A1	3412	C2	5508	B7	6236	B4
1208	A1	1564	A3	2232	A5	2353	A6	2559	E3	3269	A1	3413	C2	5509	C1	6237	B4
1209	A3	1566	B7	2233	A4	2354	B6	2560	D3	3321	D4	3542	B2	5520	A5	6240	A3
1210	A2	1567	B7	2243	B5	2356	B6	2573	A7	3322	E4	3572	C3	5521	A5	6241	A2
1222	A2	1568	A2	2245	A5	2357	D6	2574	A7	3356	D7	3573	D3	6220	A2	6242	A2
1322	E7	1569	A4	2248	A6	2405	B1	2577	D3	3357	D7	3601	C1	6221	B2	6243	A2
1323	C7	1570	A2	2323	E5	2500	C4	2578	D2	3358	D7	3602	C2	6222	A2	6244	A3
1325	B7	2219	C4	2324	D5	2503	D4	2579	B1	3359	D7	3609	D3	6223	A2	6245	A3
1507	A7	2220	A2	2333	E6	2504	C4	2580	D3	3360	D7	3610	D3	6224	A3	6248	A3
1508	B1	2221	A2	2334	D6	2505	D5	2581	B2	3361	A7	5005	A3	6225	A3	6249	A3

6250	A3	6330	B2	7249	A1	9209	B4	9234	C4	9258	D5	9501	B1	9521	D3	9543	C2
6251	A3	6502	C2	7250	A5	9210	B5	9235	B6	9259	D5	9502	C1	9522	C3	9544	C2
6252	A4	6549	E5	7329	A5	9211	B1	9237	B7	9285	C5	9503	C1	9523	D3	9550	D5
6253	A4	6550	E5	7330	B6	9216	B4	9238	B7	9286	B7	9504	B2	9524	B2	9552	E5
6254	A4	6551	B1	7391	C5	9217	B4	9239	B7	9287	A5	9505	C1	9525	B4	9560	B2
6255	A4	6552	A6	7401	C2	9218	B4	9240	C7	9288	A7	9506	C1	9526	C5	9561	C1
6256	A4	6553	C2	7503	E2	9219	E2	9241	A4	9300	D7	9507	C1	9527	D2		
6257	A7	7233	A6	7504	D2	9220	C1	9242	A5	9301	D7	9508	D2	9528	D1		
6258	A7	7234	A6	7505	D3	9221	A5	9243	A4	9302	D7	9509	C1	9529	D1		
6269	A6	7235	A6	7506	D3	9222	B4	9244	C5	9305	A6	9510	D2	9530	D1		
6321	B6	7236	A7	7507	D3	9223	A4	9245	A7	9306	A6	9511	D3	9531	D1		
6322	C6	7237	A6	7508	D3	9224	B4	9246	D5	9307	C7	9513	C2	9533	D1		
6323	B6	7240	B4	9200	A1	9225	A5	9247	E5	9308	B5	9514	C2	9534	D1		
6324	C6	7241	B3	9201	A2	9226	A5	9248	C4	9309	B5	9515	C2	9535	D2		
6325	B6	7244	A4	9202	A2	9227	B5	9253	B5	9310	B5	9516	C2	9536	E1		
6326	A6	7245	A4	9204	A1	9228	B5	9254	B6	9311	B5	9517	D3	9537	E1		
6327	A6	7246	A4	9205	B1	9229	A5	9255	B6	9312	C6	9518	D3	9538	E1		
6328	B5	7247	B4	9206	A3	9230	B5	9256	B2	9315	D7	9519	D4	9540	D2		
6329	A6	7248	C4	9208	A4	9231	B4	9257	B2	9500	B1	9520	D3	9541	E3		

MAIN PART - COMPONENT LAYOUT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CAUTION:
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE: TR 5, SLOW BLOW, 125V MIN. FUSE.
REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
IEC T4A UL T5A
UL T315mA IEC T315mA
IEC T4A UL T5A
IEC T1.6A
MPEG SUPPLY
VOUT
VIN
ATTENTION:
POUR PROTECTION CONTRE INCENDIE, RECHANCEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE:FUSIBLE TR 5, LENT, 125V MIN.
CONTROL 2
FRONT SUPPLY + CONTROL
POWER DOWN
PWN VOLUME CONTROL
AUDIO BOARD
TUNER
MIC IN
MTF
ETF
SOUND PROCESSOR
SOURCE SELECTOR
PHILIPS
8239_210_84590
mgslpang/mentor/fw386cb_18w/3139_113_33901_01
Grey 25%

2234	A2	2360	A4	2520	E4	2550	D4	2585	D4	3221	A3	3278	A2	3344	C3
2235	A6	2361	D7	2521	D4	2553	D7	2586	E4	3222	A4	3279	A2	3345	B3
2246	A2	2362	B6	2522	E4	2554	D7	2587	D4	3223	A3	3280	A2	3346	C3
2247	A2	2363	B6	2523	D5	2555	D7	2588	D5	3242	B4	3281	A2	3347	B2
2321	E3	2364	A1	2524	D4	2556	C7	2589	E5	3243	C4	3282	A2	3348	C2
2322	D3	2365	A1	2525	D4	2557	E7	2591	C5	3247	B4	3283	B4	3349	B2
2327	E3	2366	C1	2530	D6	2558	E7	2592	D5	3249	B4	3325	E3	3350	C2
2328	D3	2400	C6	2531	D6	2561	E6	2593	D4	3251	B7	3326	D3	3351	B2
2329	E3	2401	C6	2532	E4	2563	E7	2594	E4	3252	B5	3329	D3	3352	C2
2330	D3	2402	B6	2533	D4	2564	A1	2595	D6	3253	C5	3330	D3	3353	B2
2331	E3	2501	E6	2534	E4	2565	A1	2596	D6	3254	C5	3331	D3	3354	C2
2332	D3	2502	D6	2535	D4	2566	A1	2597	B1	3259	A2	3332	D3	3367	B2
2335	E3	2506	C6	2537	D4	2567	D4	2598	E5	3260	A2	3333	D2	3368	B1
2336	E3	2510	D5	2538	E4	2568	B7	3209	C4	3261	A2	3334	D3	3369	C2
2340	B3	2511	D5	2539	D4	2569	B7	3210	C4	3263	A2	3335	E3	3370	C1
2341	B3	2512	D5	2540	E4	2570	E3	3212	C4	3270	A2	3336	D3	3371	B1
2343	B3	2513	D5	2541	D4	2571	E3	3213	B4	3271	A2	3337	E3	3372	D3
2344	C3	2514	D5	2542	E4	2572	A1	3214	B4	3272	A2	3338	D2	3378	B7
2345	B2	2515	D5	2544	E6	2575	D4	3215	C4	3273	A2	3339	E2	3379	D3
2346	C2	2516	D6	2545	D4	2576	E4	3216	A4	3274	A2	3340	D2	3380	D3
2355	B2	2517	E3	2546	E4	2582	E5	3217	A3	3275	A2	3341	E3	3382	B2
2358	C1	2518	D4	2548	E6	2583	D5	3219	A4	3276	A2	3342	E3	3383	B1
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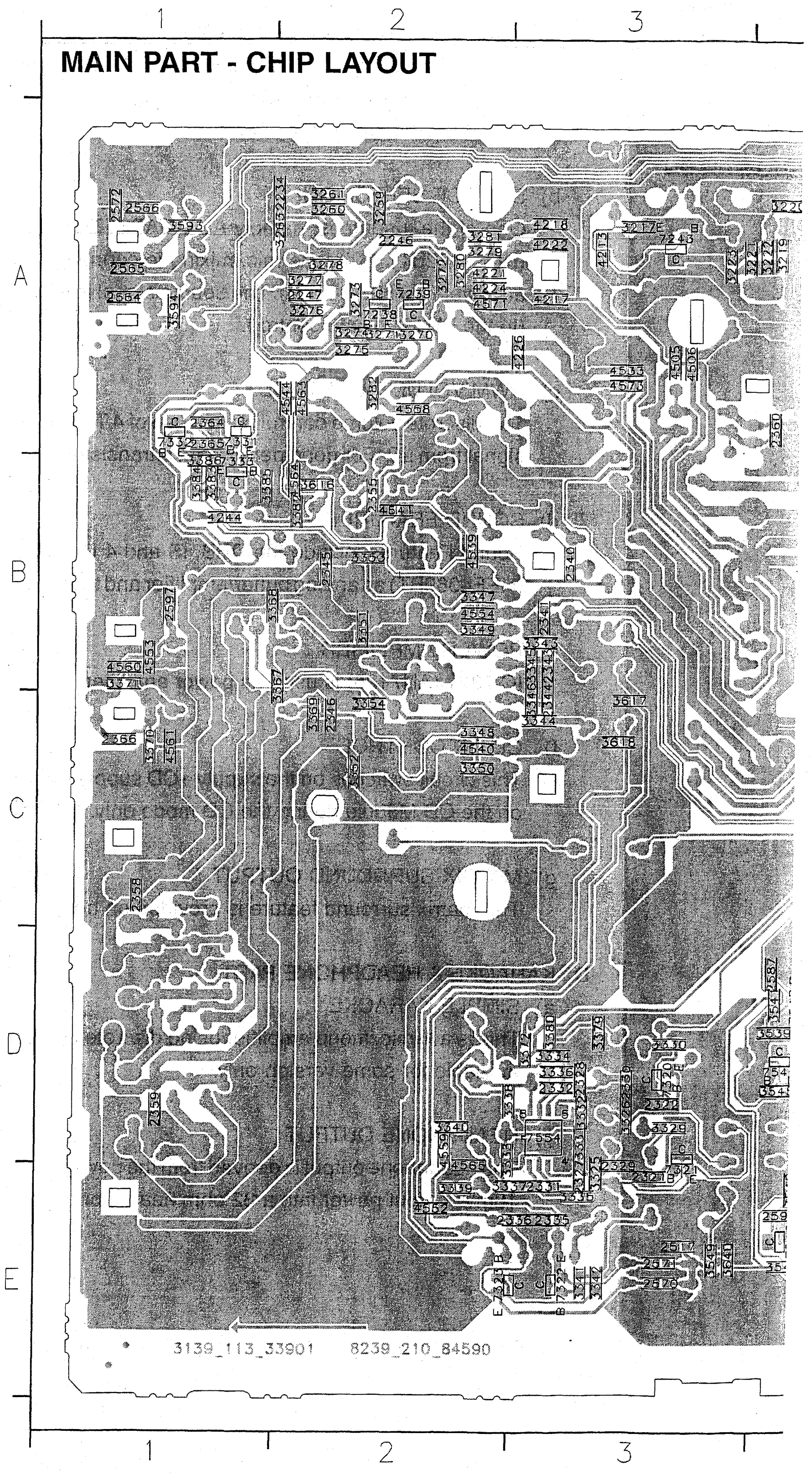
MAIN PART - CHIP LAYOUT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3139_113_33901
8239_210_84590

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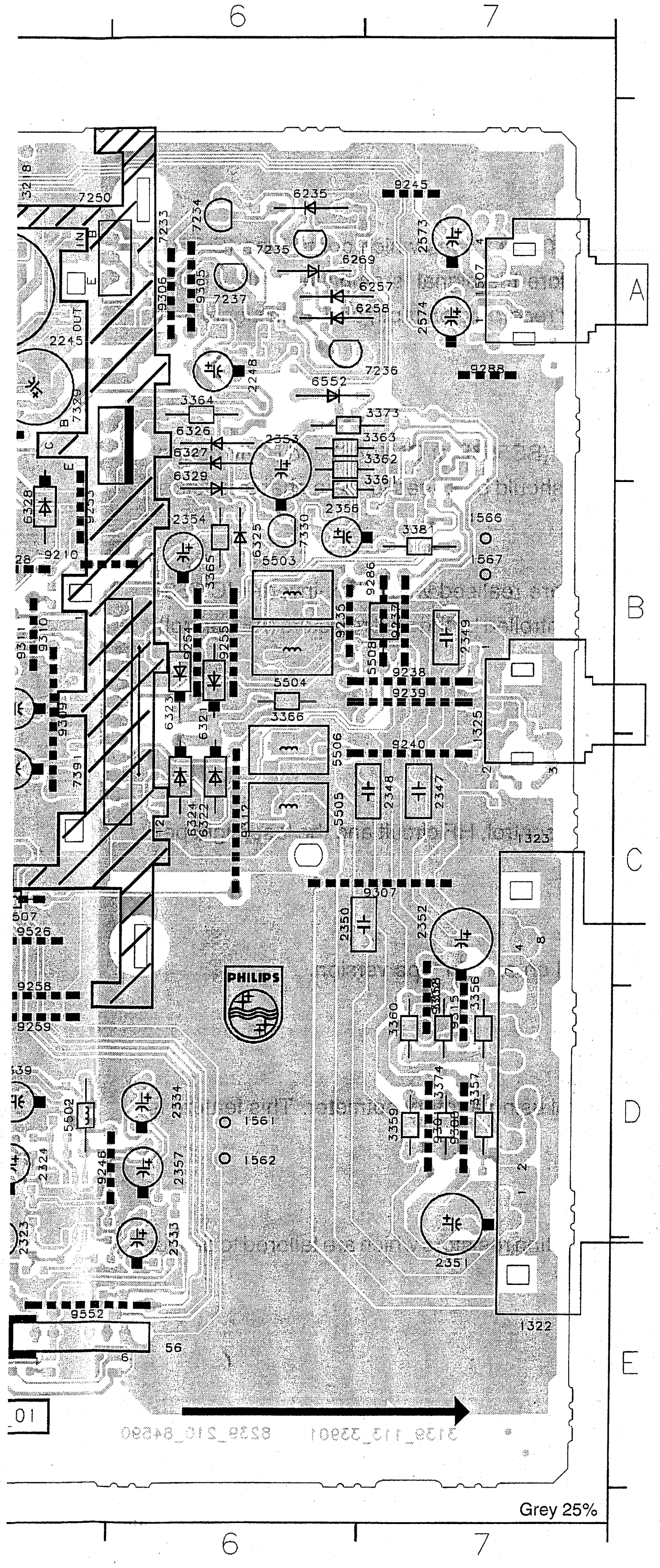
9211	B1	9237	B7	9285	C5	9503	C1	9523	D3	9550	D5
9216	B4	9238	B7	9286	B7	9504	B2	9524	B2	9552	E5
9217	B4	9239	B7	9287	A5	9505	C1	9525	B4	9560	B2
9218	B4	9240	C7	9288	A7	9506	C1	9526	C5	9561	C1
9219	E2	9241	A4	9300	D7	9507	C1	9527	D2		
9220	C1	9242	A5	9301	D7	9508	D2	9528	D1		
9221	A5	9243	A4	9302	D7	9509	C1	9529	D1		
9222	B4	9244	C5	9305	A6	9510	D2	9530	D1		
9223	A4	9245	A7	9306	A6	9511	D3	9531	D1		
9224	B4	9246	D5	9307	C7	9513	C2	9533	D1		
9225	A5	9247	E5	9308	B5	9514	C2	9534	D1		
9226	A5	9248	C4	9309	B5	9515	C2	9535	D2		
9227	B5	9253	B5	9310	B5	9516	C2	9536	E1		
9228	B5	9254	B6	9311	B5	9517	D3	9537	E1		
9229	A5	9255	B6	9312	C6	9518	D3	9538	E1		
9230	B5	9256	B2	9315	D7	9519	D4	9540	D2		
9231	B4	9257	B2	9500	B1	9520	D3	9541	E3		



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2246	A2	2362	B6	2522	E4	2554	D7	2587	D4	3223	A3	3280	A2	3346	C3	3387	B6
2247	A2	2363	B6	2523	D5	2555	D7	2588	D5	3242	B4	3281	A2	3347	B2	3388	B6
2321	E3	2364	A1	2524	D4	2556	C7	2589	E5	3243	C4	3282	A2	3348	C2	3390	E6
2322	D3	2365	A1	2525	D4	2557	E7	2591	C5	3247	B4	3283	B4	3349	B2	3400	C7
2327	E3	2366	C1	2530	D6	2558	E7	2592	D5	3249	B4	3325	E3	3350	C2	3401	B7
2328	D3	2400	C6	2531	D6	2561	E6	2593	D4	3251	B7	3326	D3	3351	B2	3402	B6
2329	E3	2401	C6	2532	E4	2563	E7	2594	E4	3252	B5	3329	D3	3352	C2	3403	B7
2330	D3	2402	B6	2533	D4	2564	A1	2595	D6	3253	C5	3330	D3	3353	B2	3404	B6
2331	E3	2501	E6	2534	E4	2565	A1	2596	D6	3254	C5	3331	D3	3354	C2	3406	C7
2332	D3	2502	D6	2535	D4	2566	A1	2597	B1	3259	A2	3332	D3	3367	B2	3407	C7
2335	E3	2506	C6	2537	D4	2567	D4	2598	E5	3260	A2	3333	D2	3368	B1	3409	B7
2336	E3	2510	D5	2538	E4	2568	B7	3209	C4	3261	A2	3334	D3	3369	C2	3410	B7
2340	B3	2511	D5	2539	D4	2569	B7	3210	C4	3263	A2	3335	E3	3370	C1	3501	D5
2341	B3	2512	D5	2540	E4	2570	E3	3212	C4	3270	A2	3336	D3	3371	B1	3502	D5
2343	B3	2513	D5	2541	D4	2571	E3	3213	B4	3271	A2	3337	E3	3372	D3	3503	D4
2344	C3	2514	D5	2542	E4	2572	A1	3214	B4	3272	A2	3338	D2	3378	B7	3504	E4
2345	B2	2515	D5	2544	E6	2575	D4	3215	C4	3273	A2	3339	E2	3379	D3	3505	D4
2346	C2	2516	D6	2545	D4	2576	E4	3216	A4	3274	A2	3340	D2	3380	D3	3506	E4
2355	B2	2517	E3	2546	E4	2582	E5	3217	A3	3275	A2	3341	E3	3382	B2	3507	D4
2358	C1	2518	D4	2548	E6	2583	D5	3219	A4	3276	A2	3342	E3	3383	B1	3508	E4
2359	D1	2519	D4	2549	D4	2584	E4	3220	A4	3277	A2	3343	B3	3384	B1	3509	D4

3510	E4	3539	D4	3563	D7	3592	E4	4224	A2	4517	E6	4543	E6	4568	C4	7501	D6
3511	D4	3540	E4	3564	D6	3593	A1	4226	A3	4518	D6	4544	A2	4569	C4	7530	D4
3512	E4	3541	D4	3565	E6	3594	A1	4228	C7	4519	D7	4545	D5	4570	C6	7537	D5
3517	D6	3543	D4	3566	D7	3596	D5	4229	C7	4520	D5	4546	C6	4571	A2	7538	E4
3518	E4	3544	E4	3567	D7	3597	D5	4230	E5	4521	D5	4547	D7	4572	D7	7539	D4
3519	D4	3545	D4	3568	D6	3603	D5	4231	D5	4522	D5	4549	C7	4573	A3	7540	E4
3522	E4	3546	E4	3569	D6	3604	E4	4232	D6	4523	D5	4550	C7	4574	C6	7543	D4
3523	D4	3547	D4	3570	C7	3605	C4	4233	D6	4524	D5	4551	E7	4575	C6	7544	E5
3524	E5	3548	D4	3571	C7	3606	E5	4244	B1	4525	D5	4552	E2	4579	D4	7545	D4
3525	D5	3549	E3	3574	E7	3611	D4	4501	C7	4526	A4	4553	B1	4580	D7	7546	E4
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3527	D4	3551	D5	3576	E7	3617	C3	4503	A4	4531	D6	4555	A7	7238	A2	7548	E4
3528	E4	3552	D5	3577	E7	3618	C3	4505	A3	4532	D5	4556	E6	7239	A2	7549	D4
3529	D4	3553	E5	3579	E6	3638	D6	4506	A3	4533	A3	4557	C4	7243	A3	7550	E4
3530	E4	3554	D5	3580	D5	3639	D6	4508	E7	4534	D5	4558	A2	7320	D3	7554	D3
3531	D4	3555	D4	3581	E6	3640	E3	4509	D6	4535	D5	4559	D2	7321	E3	7556	B6
3532	E4	3556	D6	3582	E7	4213	A3	4510	D7	4536	A4	4560	B1	7322	E3		
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3534	E4	3558	D6	3584	C6	4215	A4	4512	D6	4538	D4	4563	A2	7331	A1		
3535	D4	3559	E6	3585	D6	4217	A3	4513	D6	4539	B2	4564	B2	7332	A1		
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3537	D4	3561	E6	3587	C6	4221	A2	4515	D6	4541	B2	4566	B6	7400	B7		
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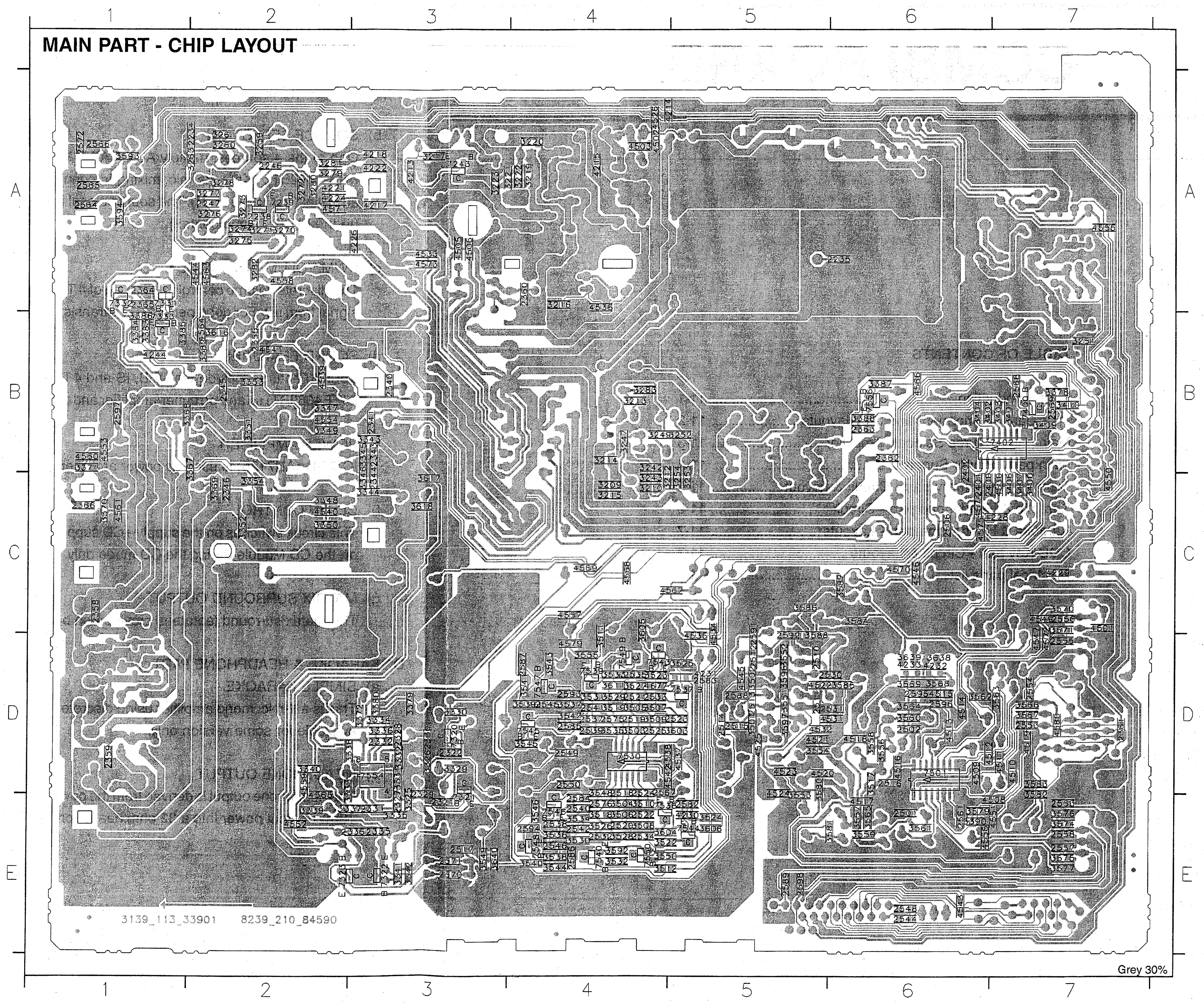
MAIN PART - CHIP LAYOUT



CIRCUIT DIAGRAM - SOURCE SELECT & AMPLIFIER PART

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51 D2
52 A1
55 B5
56 B15
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1322-A H14
1322-B G14
1323-A H15
1323-B H15
1323-C G15
1323-D G15
1325 G15
1507 A1
1508 F1
1509 F1
1510 D2
1511 F1
1512 C1
1517 B1
1518 A1
2321 B12
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2329 B13
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2331 A13
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2334 C14
2335 B14
2336 D14
2337 G9
2338 H9
2339 B11
2340 E15
2341 E15
2342 H7
2343 G10
2344 H10
2345 G13
2346 H13
2347 G13
2348 G13
2349 F13
2350 H13
2351 H15
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2353 F10
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2356 E14
2357 C14
2358 G13
2359 H13
2360 A14
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2363 G7
2364 F12
2365 E13
2366 F15
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2402 H4
2405 G2
2500 C10
2501 B5
2502 D5
2503 F8
2504 D7
2505 D10
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2507 G5
2508 E4
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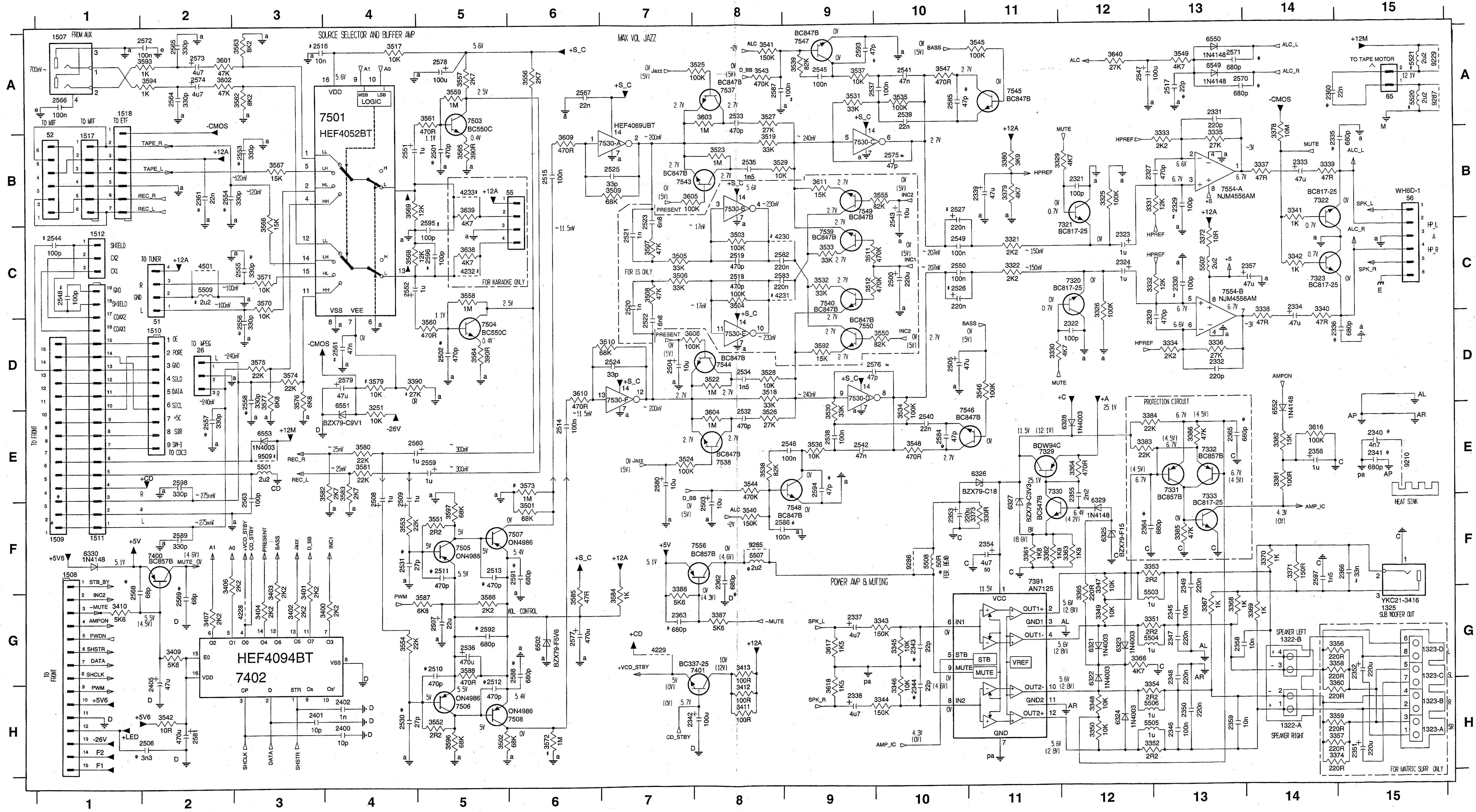
3403 F3
3404 G3
3406 F2
3407 G2
3409 G2
3410 G1
3411 H8
3412 H8
3413 G8
3501 F6
3502 H5
3503 C8
3504 C8
3505 C7
3506 C7
3507 C7
3508 C7
3509 B7
3510 D7
3511 C9
3512 C9
3517 A4
3518 D8
3519 B8
3522 D8
3523 B8
3524 E7
3525 A8
3526 E8
3527 A8
3528 D8
3529 B8
3530 E9
3531 A9
3532 C9
3533 C9
3534 E10
3535 A10
3536 E9
3537 A9
3538 E8
3539 A9
3540 F8
3541 A8
3542 H2
3543 A8
3544 E8
3545 A11
3546 D11
3547 A10
3548 E10
3549 A13
3550 D10
3551 F5
3552 H5
3553 F4
3554 G4
3555 B10
3556 A6
3557 A5
3558 C5
3559 A5
3560 D5
3561 A5
3562 A3
3563 A3
3564 D5
3565 B5
3566 B3
3567 B3
3568 C4
3569 B4
3570 C3
3571 C3
3572 H6
3573 E6
3574 D3
3575 D3
3576 D3
3577 D3
3579 D4
3580 E4
3581 E4
3582 E4
3583 E4
3584 G7
3585 G6
3586 G5
3587 G5
3588 G5
3592 D9
3593 A2
3594 A2
3596 H5
3597 F5
3601 A2
3602 A2
3603 A8
3604 E8
3605 B7
3606 D7
3609 B6
3610 D6
3611 B9
3616 E14
3617 G9
3618 H9
3638 C5
3639 B5
3640 A12
4228 G3
4229 G7
4230 C8
4231 C8
4232 C5
4233 B5
4501 C2
5501 E3
5502 C13
5503 G12
5504 G12
5505 H12
5506 H12
5507 F8
5508 F10
5509 C2
5520 A15
5521 A15
6321 G12
6322 G12
6323 G12
6324 H12
6325 F12
6326 E11
6327 F11
6328 E12
6329 F12
6330 F1
6502 G6
6549 A13
6550 A13
6551 D4
6552 E14
6553 E3
7320 C12
7321 C11
7322 B14
7323 C14
7329 E11
7330 E11
7331 E13
7332 E13
7333 F13
7391 F11
7400 F2
7401 G8
7402 G3
7501 A3
7503 A5
7504 D5
7505 F5
7506 H5
7507 F5
7508 H5
7530-A B6
7530-B B8
7530-C B9
7530-D D9
7530-E D8
7530-F D7
7537 A8
7538 E8
7539 C9
7540 C9
7543 B7
7544 D8
7545 A11
7546 E11
7547 A9
7548 F9
7549 B9
7550 D9
7554-A B13
7554-B C13
7556 F7
9210 E15
9229 A15
9285 F8
9286 F10
9287 A15
9509 E3

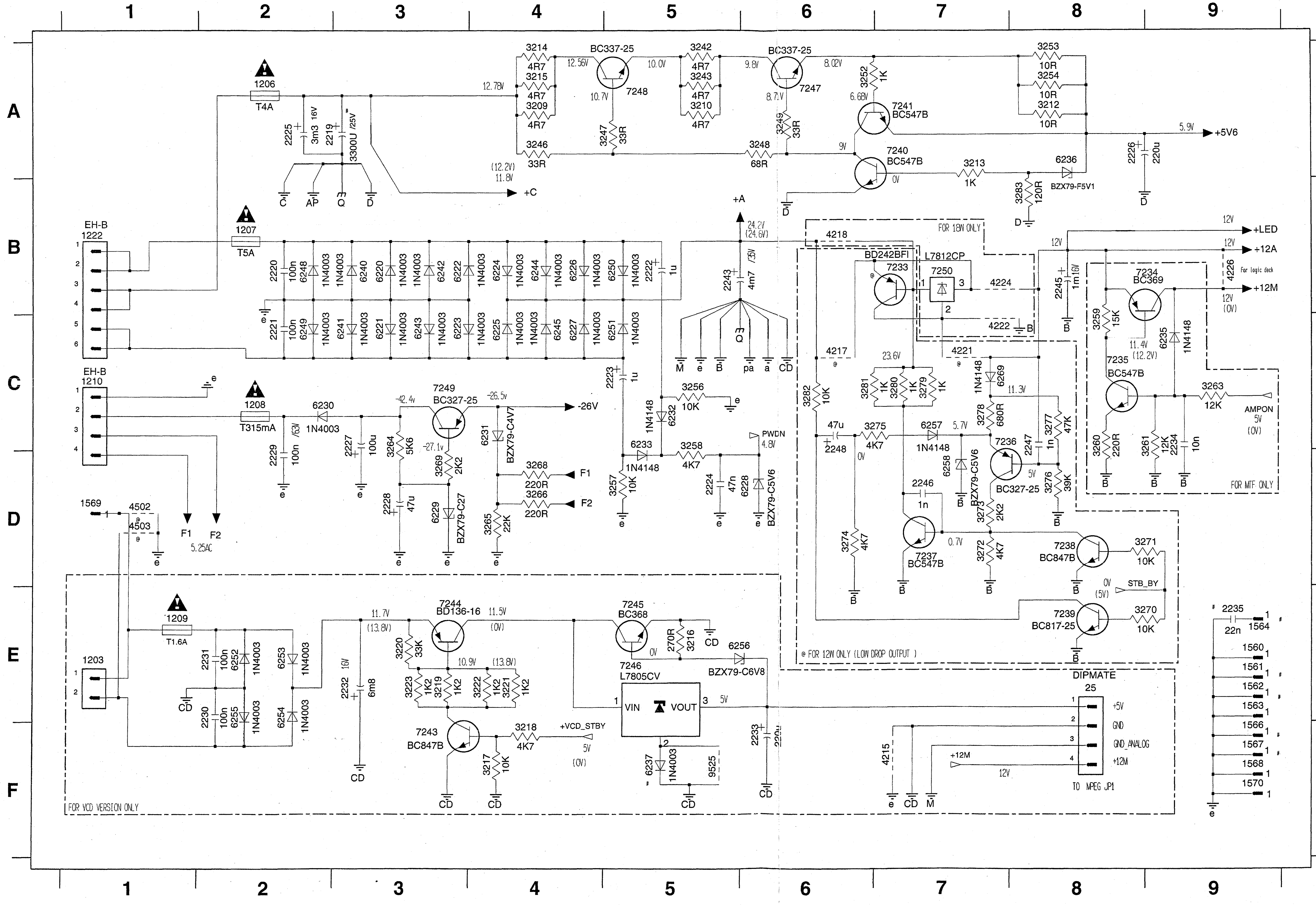

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
1507 FROM AUX
SOURCE SELECTOR AND BUFFER AMP
7501
HEF4052BT
MSB LSB
LOGIC
VDD
VSS VEE
MAX VOL JAZZ
HEF4069UBT
7530-A
7530-B
7530-C
7530-D
7530-E
7530-F
FOR IS ONLY
PRESENT
BC847B
BC550C
BC817-25
BC857B
BC547B
BC337-25
ON4986
7554-A NJM4556AM
7554-B NJM4556AM
PROTECTION CIRCUIT
BDW94C
BZX79-C18
BZX79-C9V1
BZX79-F15
1N4148
1N4003
HEF4094BT
7402
POWER AMP & MUTING
7391 AN7125
IN1
IN2
STB
MUTE
VREF
OUT1+
OUT1-
OUT2-
OUT2+
GND1
GND2
GND
VCC
TO MTF
TO ETF
TO TUNER
TO MPEG
TO FRONT
TAPE_R
TAPE_L
REC_R
REC_L
FOR KARAOKE ONLY
HPREF
MUTE
BASS
ALC
ALC_L
ALC_R
TO TAPE MOTOR
WH6D-1
HP_L
HP_R
SPK_L
SPK_R
HEAT SINK
AMP_IC
SPEAKER LEFT
SPEAKER RIGHT
YKC21-3416
SUB WOOFER OUT
FOR MATRIC SURR ONLY
STB_BY
INC2
-MUTE
AMPON
PWDN
SHSTR
DATA
SHCLK
PWM
+5V6
-26V
+LED
F2
F1
+S_C
+12A
+12M
-CMOS
+CD
CD_STBY
+VCD_STBY

- # Provision on layout
- △ For set with Karaoke
- ▲ For set without Karaoke
- e Not For /37

	Inc 1	Inc 2	Jazz	Bass	POP	DBB
Jazz	x	x	L	H	L	L
Rock	x	x	H	H	H	H
Techno	x	x	L	H	L	H
Optimal	x	x	L	L	H	L
IS (vol <= 24)	H	H	x	x	x	x
IS (vol > 24)	L	H	x	x	x	x

	A0	A1
AUX	0	0
TUNER	0	1
TAPE	1	0
CD	1	1

CIRCUIT DIAGRAM - POWER SUPPLY PART


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
1206
T4A
2225
3m3 16V
2219
3300U /25V
C
AP
Q
D
+C
12.78V
3214
4R7
3215
4R7
3209
4R7
3246
33R
(12.2V)
11.8V
BC337-25
12.56V
10.7V
7248
3247
33R
10.0V
3242
4R7
3243
4R7
3210
4R7
3248
68R
BC337-25
9.8V
8.7V
7247
3249
33R
8.02V
3252
1K
6.68V
7241
BC547B
9V
7240
BC547B
0V
3213
1K
3283
120R
6236
BZX79-F5V1
3253
10R
3254
10R
3212
10R
5.9V
+5V6
2226
220u
EH-B
1222
1207
T5A
2220
100n
6248
1N4003
6240
6220
6242
6222
6224
6244
6226
6250
2222
1u
2221
6249
6241
6221
6243
6223
6225
6245
6227
6251
+A
24.2V
(24.6V)
2243
4m7 /35V
M
e
B
Q
pa
a
CD
FOR 18W ONLY
4218
BD242BFI
7233
L7812CP
7250
4224
4222
4217
23.6V
4221
3282
10K
3281
1K
3280
1K
3279
1K
1N4148
6269
11.3V
3278
680R
3277
47K
47u
2248
3275
4K7
6257
1N4148
5.7V
7236
BC327-25
2247
1n
5V
3276
39K
6258
BZX79-C5V6
2246
1n
3273
2K2
7237
BC547B
0.7V
3274
4K7
3272
4K7
7238
BC847B
3271
10K
0V
(5V)
STB_BY
7239
BC817-25
3270
10K
@ FOR 12W ONLY (LOW DROP OUTPUT)
12V
+LED
+12A
2245
1m 16V
4226
For logic deck
7234
BC369
+12M
12V
(0V)
3259
15K
11.4V
(12.2V)
6235
1N4148
7235
BC547B
3263
12K
AMPON
5V
(0V)
3260
220R
3261
12K
2234
10n
FOR MTF ONLY
EH-B
1210
1208
T315mA
6230
1N4003
2229
100n /63V
2227
100u
-42.4v
3264
5K6
7249
BC327-25
-27.1v
3269
2K2
-26.5v
-26V
6231
BZX79-C4V7
3268
220R
F1
3266
220R
F2
3265
22K
2228
47u
6229
BZX79-C27
2223
1u
3256
10K
6232
1N4148
6233
1N4148
3257
10K
3258
4K7
PWDN
4.8V
2224
47n
6228
BZX79-C5V6
1569
4502
4503
F1
F2
5.25AC
1209
T1.6A
1203
2231
100n
6252
1N4003
6253
2230
100n
6255
6254
11.7V
(13.8V)
2232 16V
6m8
7244
BD136-16
11.5V
(0V)
3220
33K
10.9V
(13.8V)
3223
1K2
3219
1K2
3222
1K2
3221
1K2
7243
BC847B
3218
4K7
+VCD_STBY
5V
(0V)
3217
10K
7245
BC368
0V
270R
3216
6256
BZX79-C6V8
7246
L7805CV
VIN
VOUT
5V
6237
1N4003
9525
2233
220u
FOR VCD VERSION ONLY
DIPMATE
25
+5V
GND
GND_ANALOG
+12M
TO MPEG JP1
4215
+12M
12V
2235
22n
1564
1560
1561
1562
1563
1566
1567
1568
1570

# Provision on Layout

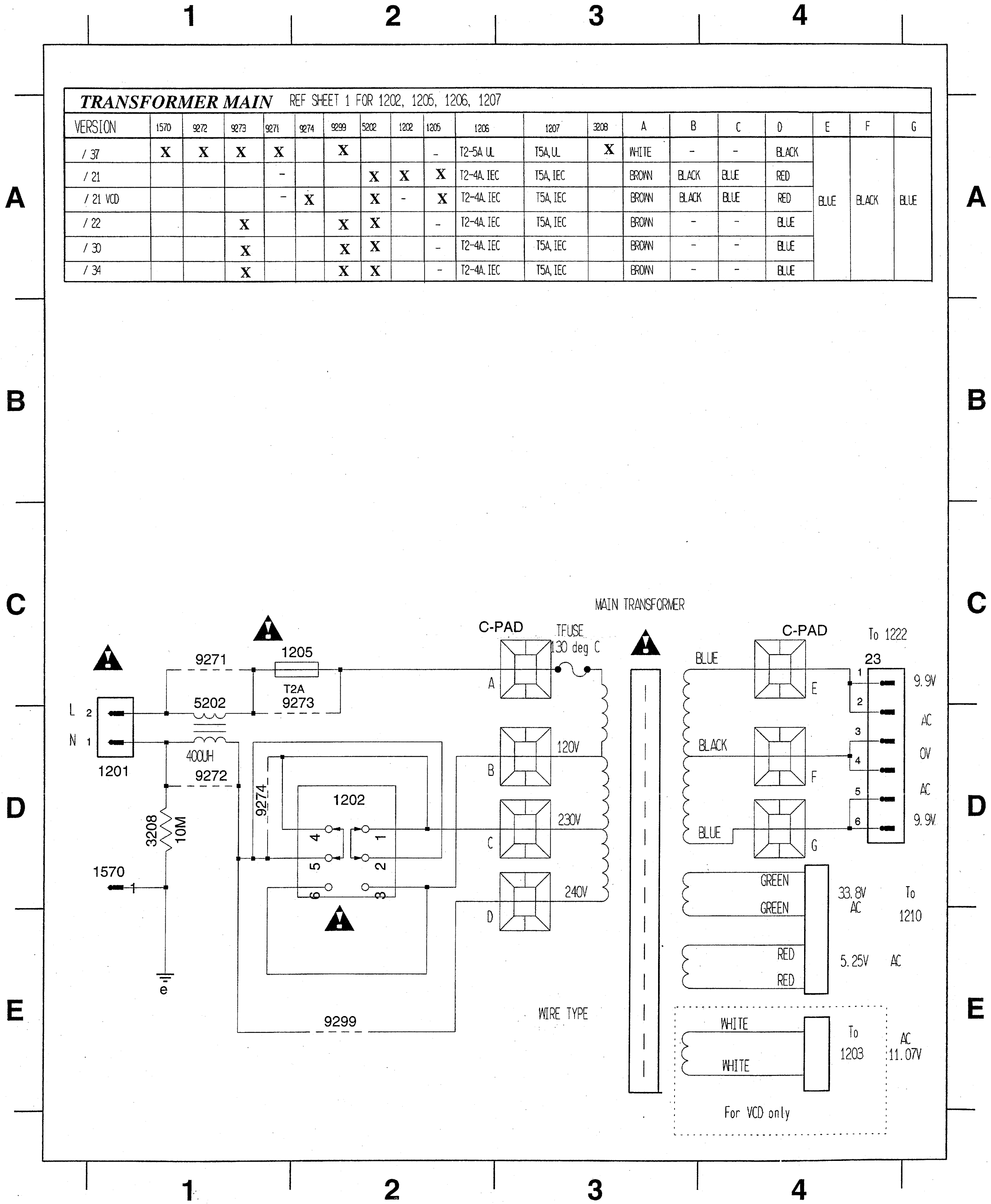
25	E8
1203	E1
1206	A2
1207	B2
1208	C2
1209	E1
1210	C1
1222	B1
1560	E9
1561	E9
1562	E9
1563	E9
1564	E9
1566	F9
1567	F9
1568	F9
1569	D1
1570	F9
2219	A2
2220	B2
2221	C2
2222	B5
2223	C5
2224	D5
2225	A2
2226	A8
2227	C3
2228	D3
2229	D2
2230	E2
2231	E2
2232	E3
2233	F6
2234	C9
2235	E9
2243	B5
2245	B8
2246	D7
2247	C8
2248	C6
3209	A4
3210	A5
3212	A8
3213	A7
3214	A4
3215	A4
3216	E5
3217	F4
3218	F4
3219	E3
3220	E3
3221	E4
3222	E4
3223	E3
3242	A5
3243	A5
3246	A4
3247	A5
3248	A6
3249	A6
3252	A6
3253	A8
3254	A8
3256	C5
3257	D5
3258	C5
3259	C8
3260	C8
3261	C9
3263	C9
3264	C3
3265	D4
3266	D4
3268	D4
3269	D3
3270	E8
3271	D8
3272	D7
3273	D7
3274	D6
3275	C6
3276	D8
3277	C8
3278	C7
3279	C7
3280	C7
3281	C6
3282	C6
3283	B8
4215	F7
4217	C6
4218	B6
4221	C7
4222	C7
4224	B7
4226	B9
4502	D1
4503	D1
6220	B3
6221	C3
6222	B3
6223	C3
6224	B4
6225	C4
6226	B4
6227	C4
6228	D5
6229	D3
6230	C2
6231	C4
6232	C5
6233	C5
6235	C9
6236	A8
6237	F5
6240	B3
6241	C3
6242	B3
6243	C3
6244	B4
6245	C4
6248	B2
6249	C2
6250	B5
6251	C5
6252	E2
6253	E2
6254	E2
6255	E2
6256	E5
6257	C7
6258	D7
6269	C7
7233	B7
7234	B8
7235	C8
7236	C7
7237	D7
7238	D8
7239	E8
7240	A7
7241	A7
7243	F3
7244	E3
7245	E5
7246	E5
7247	A6
7248	A5
7249	C3
7250	B7
9525	F5

CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

23 C4	1201 D1	1202 D2	1205 C2	1570 D1	3208 D1	5202 D1	9271 C1	9272 D1	9273 D2	9274 D1	9299 E2

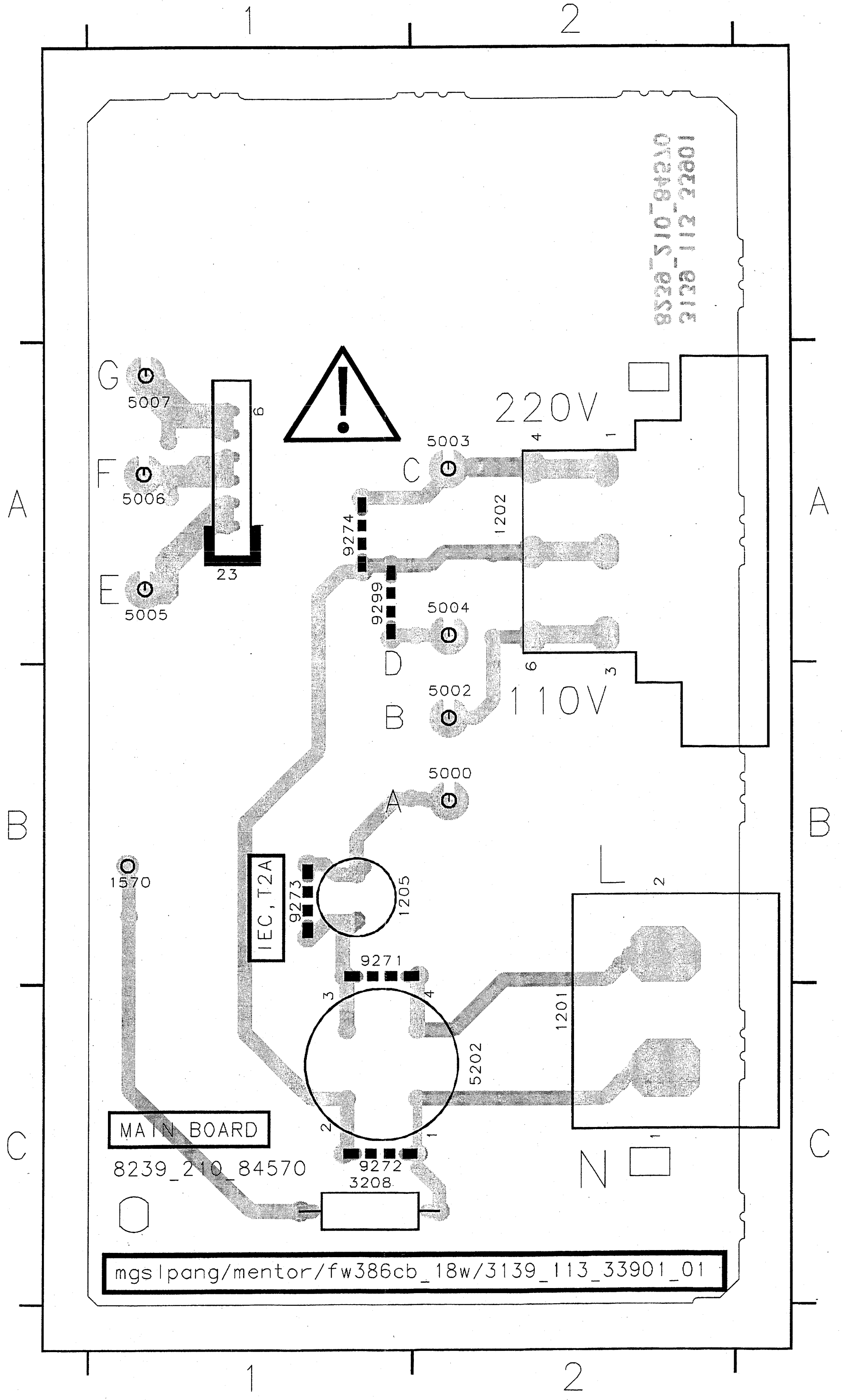
TRANSFORMER MAIN REF SHEET 1 FOR 1202, 1205, 1206, 1207

VERSION	1570	9272	9273	9271	9274	9299	5202	1202	1205	1206	1207	3208	A	B	C	D	E	F	G
/ 37	X	X	X	X		X			-	T2-5A UL	T5A, UL	X	WHITE	-	-	BLACK	BLUE	BLACK	BLUE
/ 21				-			X	X	X	T2-4A. IEC	T5A, IEC		BROWN	BLACK	BLUE	RED			
/ 21 VCD				-	X		X	-	X	T2-4A. IEC	T5A, IEC		BROWN	BLACK	BLUE	RED			
/ 22			X			X	X		-	T2-4A. IEC	T5A, IEC		BROWN	-	-	BLUE			
/ 30			X			X	X		-	T2-4A. IEC	T5A, IEC		BROWN	-	-	BLUE			
/ 34			X			X	X		-	T2-4A. IEC	T5A, IEC		BROWN	-	-	BLUE			


1
2
3
4
A
B
C
D
E
MAIN TRANSFORMER
C-PAD
TFUSE
130 deg C
C-PAD
To 1222
23
9271
1205
T2A
9273
5202
400UH
9272
L 2
N 1
1201
9274
1202
3208
10M
1570
A
B
C
D
E
F
G
120V
230V
240V
BLUE
BLACK
BLUE
9.9V
AC
0V
AC
9.9V
GREEN
GREEN
33.8V AC
To 1210
RED
RED
5.25V AC
9299
WIRE TYPE
WHITE
WHITE
To 1203
AC 11.07V
For VCD only

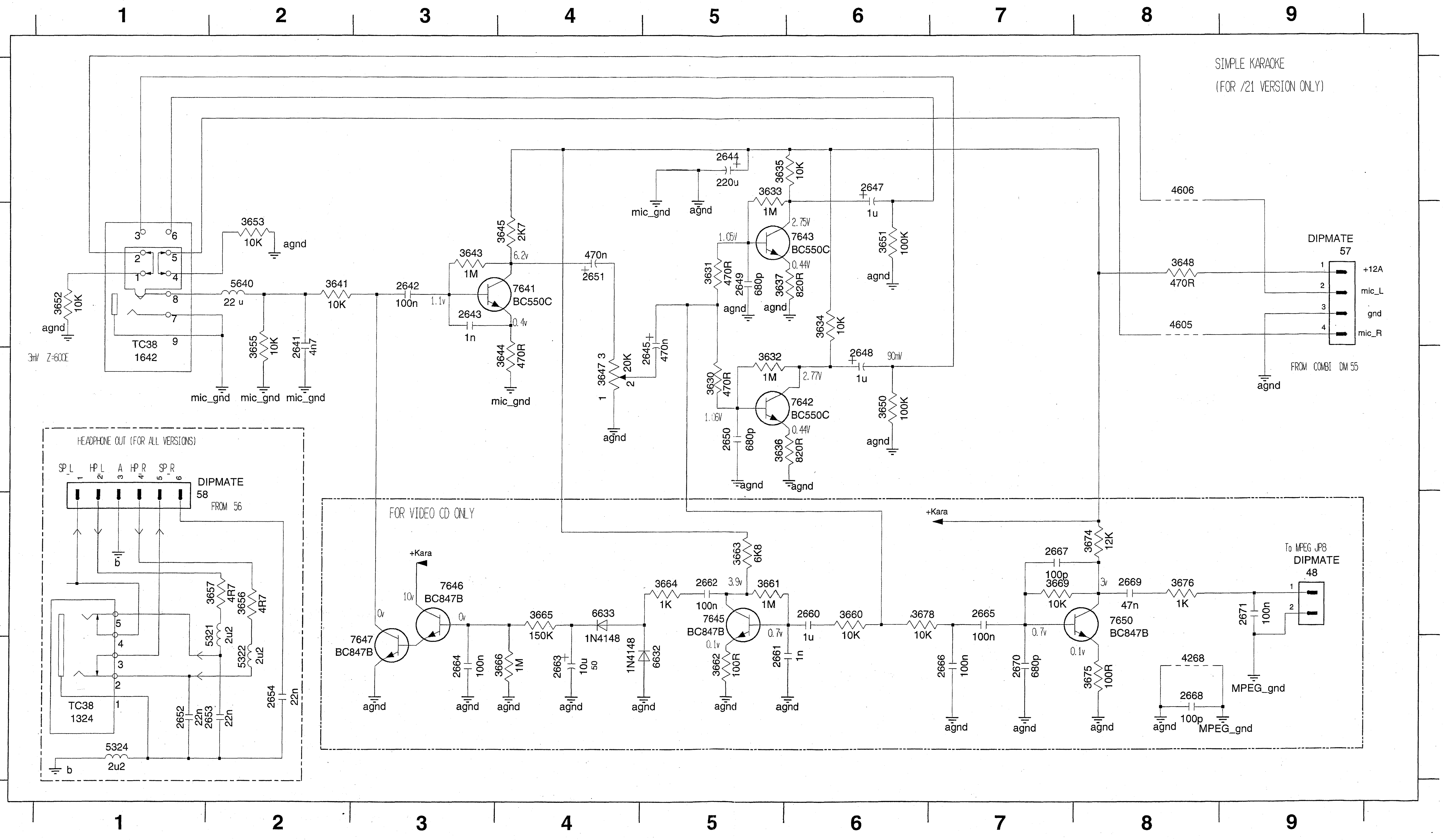
COMPONENT LAYOUT - TRANSFORMER PRIMARY

23 A1	1570 B1	5003 A2	5007 A1	9273 B1
1201 C2	3208 C1	5004 A2	5202 C2	9274 A1
1202 A2	5000 B2	5005 A1	9271 B1	9299 A1
1205 B1	5002 B2	5006 A1	9272 C1	


1
2
A
B
C
8239_210_84570
3139_112_32801
G
5007
F
5006
E
5005
23
220V
5003
C
1202
9274
9299
5004
D
5002
B
110V
5000
A
1570
IEC, T2A
9273
1205
9271
L
1201
5202
MAIN BOARD
8239_210_84570
9272
3208
N
mgslpang/mentor/fw386cb_18w/3139_113_33901_01

CIRCUIT DIAGRAM - KARAOKE & HEADPHONE PART

48	D9
57	B9
58	D1
1324	E1
1642	C1
2641	B2
2642	B3
2643	B3
2644	A5
2645	C5
2647	A6
2648	C6
2649	B5
2650	C5
2651	B4
2652	E1
2653	E2
2654	E2
2660	D6
2661	E5
2662	D5
2663	E4
2664	E3
2665	D7
2666	E7
2667	D7
2668	E8
2669	D8
2670	E7
2671	D9
3630	C5
3631	B5
3632	C5
3633	A5
3634	B6
3635	A5
3636	C5
3637	B5
3641	B2
3643	B3
3644	C4
3645	B4
3647	C4
3648	B8
3650	C6
3651	B6
3652	B1
3653	B2
3655	B2
3656	D2
3657	D2
3660	D6
3661	D5
3662	E5
3663	D5
3664	D5
3665	D4
3666	E4
3669	D7
3674	D8
3675	E8
3676	D8
3678	D6
4268	E8
4605	B8
4606	A8
5321	D2
5322	E2
5324	E1
5640	B2
6632	E5
6633	D4
7641	B4
7642	C6
7643	B6
7645	D5
7646	D3
7647	E3
7650	D8



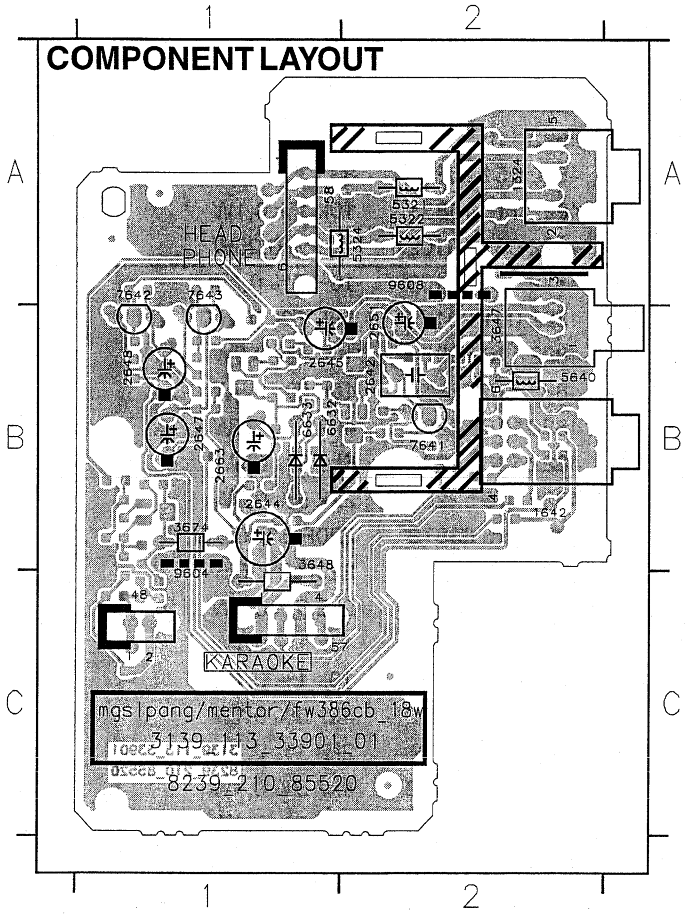
1
2
3
4
5
6
7
8
9
A
B
C
D
E
SIMPLE KARAOKE
(FOR /21 VERSION ONLY)
3652
10K
agnd
3mV Z-600E
TC38
1642
3
6
2
5
1
4
8
7
9
3653
10K
agnd
5640
22 u
3655
10K
2641
4n7
mic_gnd
mic_gnd
mic_gnd
3641
10K
2642
100n
1.1v
3643
1M
3645
2K7
6.2v
7641
BC550C
2643
1n
0.4v
3644
470R
mic_gnd
470n
2651
3647
20K
1
2
3
agnd
2645
470n
2644
220u
mic_gnd
agnd
3635
10K
3633
1M
2.75V
7643
BC550C
0.44V
1.05V
3631
470R
2649
680p
3637
820R
agnd
agnd
2647
1u
3651
100K
agnd
3634
10K
3632
1M
2.77V
2648
90mV
1u
3630
470R
1.06V
7642
BC550C
0.44V
2650
680p
3636
820R
agnd
agnd
3650
100K
agnd
4606
4605
3648
470R
DIPMATE
57
1
2
3
4
+12A
mic_L
gnd
mic_R
FROM COMBI DM 55
agnd
HEADPHONE OUT (FOR ALL VERSIONS)
SP_L
HP_L
A
HP_R
SP_R
1
2
3
4
5
6
DIPMATE
58
FROM 56
b
3657
4R7
3656
4R7
5321
2u2
5322
2u2
5
4
3
2
1
TC38
1324
2654
22n
2652
22n
2653
22n
5324
2u2
b
FOR VIDEO CD ONLY
+Kara
+Kara
7647
BC847B
0v
10v
7646
BC847B
0v
2664
100n
3666
1M
3665
150K
6633
1N4148
2663
10u
50
1N4148
6632
3664
1K
2662
100n
3.9v
3663
6K8
3661
1M
7645
BC847B
0.1v
0.7v
3662
100R
2661
1n
2660
1u
3660
10K
3678
10K
2666
100n
2665
100n
2667
100p
3674
12K
3669
10K
3v
2669
47n
3676
1K
2670
680p
0.7v
7650
BC847B
0.1v
3675
100R
To MPEG JP8
DIPMATE
48
1
2
2671
100n
MPEG_gnd
4268
2668
100p
MPEG_gnd
agnd
agnd
agnd
agnd
agnd
agnd
agnd
agnd
agnd
agnd
agnd

KARAOKE & HEADPHONE PART

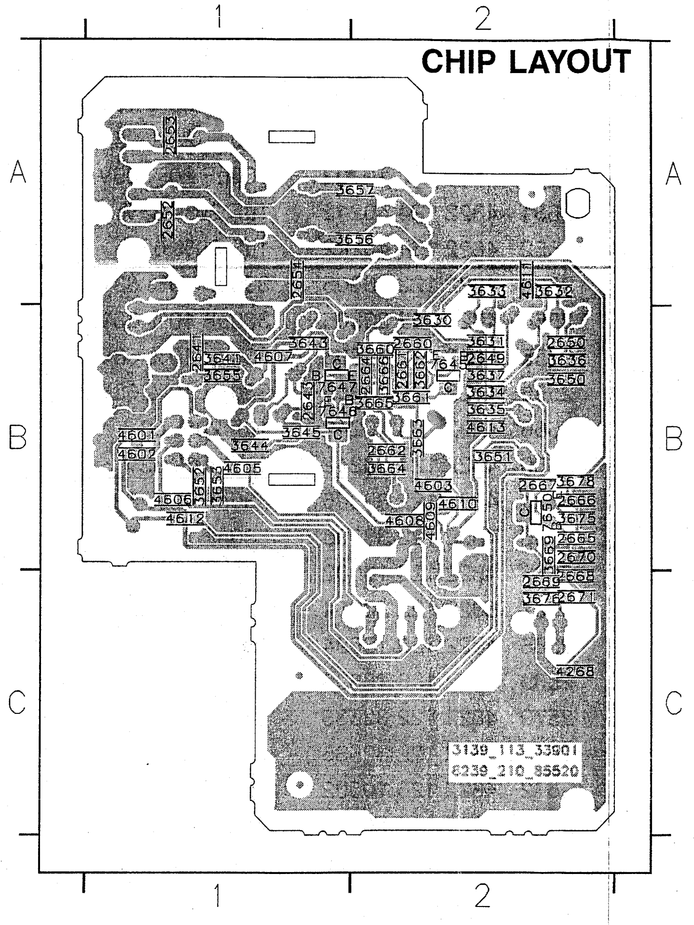
48	C1	2642	B2	2651	B2	5321	A2	6633	B1	9608	A2
57	C1	2644	B1	2663	B1	5322	A2	7641	B2		
58	A1	2645	B1	3647	B2	5324	A2	7642	A1		
1324	A2	2647	B1	3648	B1	5640	B2	7643	A1		
1642	B2	2648	B1	3674	B1	6632	B1	9604	C1		

2641	B1	2665	B2	3634	B2	3653	B1	3669	B2	4608	B2
2643	B1	2666	B2	3635	B2	3655	B1	3675	B2	4609	B2
2649	B2	2667	B2	3636	B2	3656	A2	3676	C2	4610	B2
2650	B2	2668	C2	3637	B2	3657	A2	3678	B2	4611	A2
2652	A1	2669	C2	3641	B1	3660	B2	4268	C2	4612	B1
2653	A1	2670	B2	3643	B1	3661	B2	4601	B1	4613	B2
2654	A1	2671	C2	3644	B1	3662	B2	4602	B1	7645	B2
2660	B2	3630	B2	3645	B1	3663	B2	4603	B2	7646	B1
2661	B2	3631	B2	3650	B2	3664	B2	4605	B1	7647	B1
2662	B2	3632	A2	3651	B2	3665	B2	4606	B1	7650	B2
2664	B2	3633	A2	3652	B1	3666	B2	4607	B1		

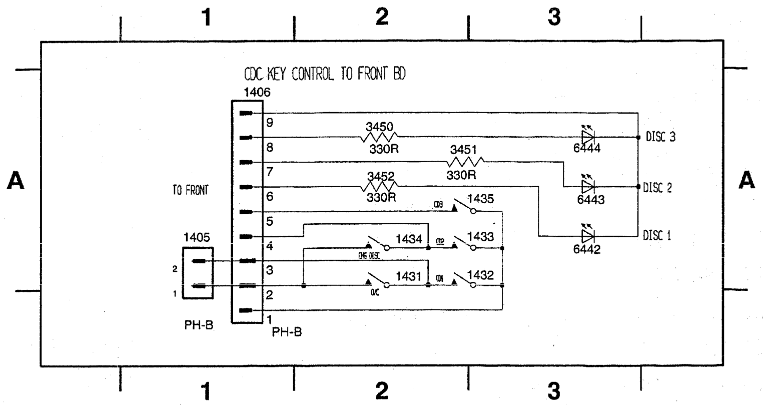
COMPONENT LAYOUT


1
2
A
B
C
HEAD PHONE
KARAOKE
mgslpang/mentor/fw386cb_18w
3139_113_33901_01
8239_210_85520

CHIP LAYOUT


1
2
A
B
C
3139_113_33901
8239_210_85520

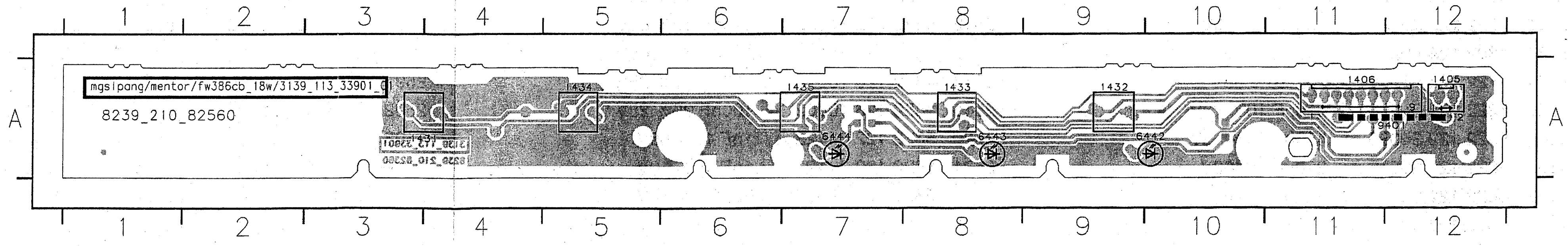
CDC KEY PART - CIRCUIT


1
2
3
A
CDC KEY CONTROL TO FRONT BD
1406
TO FRONT
1405
PH-B
PH-B
3450
330R
3451
330R
3452
330R
6444
6443
6442
DISC 3
DISC 2
DISC 1
1435
1434
1433
1431
1432
CHG DISC
O/C

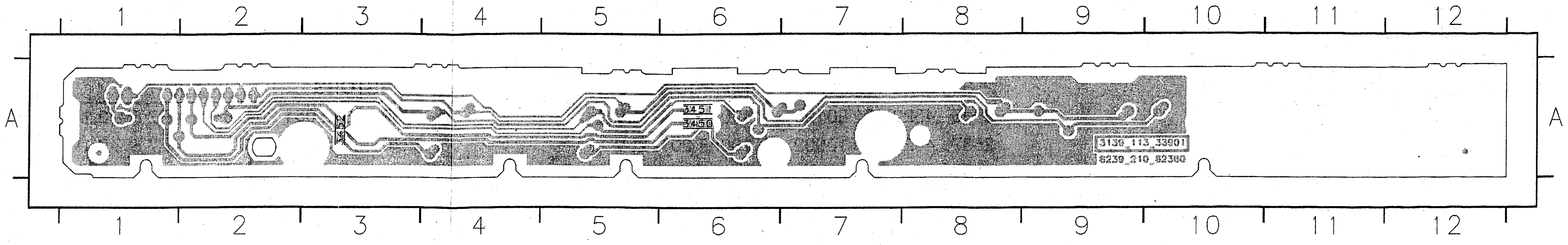
1405	A1
1406	A1
1431	A2
1432	A3
1433	A3
1434	A2
1435	A3
3450	A2
3451	A2
3452	A2
6442	A3
6443	A3
6444	A3

CDC KEY PART - COMPONENT & CHIP LAYOUT

1405	A12	1406	A11	1431	A3	1432	A9	1433	A8	1434	A5	1435	A7	6442	A10	6443	A8	6444	A7	9401	A12


1
2
3
4
5
6
7
8
9
10
11
12
A
mgslpang/mentor/fw386cb_18w/3139_113_33901_01
8239_210_82560
1431
1434
1435
1433
1432
1406
1405
9401
6444
6443
6442

3450	A6	3451	A6	3452	A3


1
2
3
4
5
6
7
8
9
10
11
12
A
3451
3450
3139_113_33901
8239_210_82560

ELECTRICAL PARTS LIST - COMBI BOARD

MISCELLANEOUS

1201	4822 265 31015 ⚠	Mains Socket
1206	4822 071 54002 ⚠	Fuse T4A 250V
1207	4822 071 55002 ⚠	Fuse T5A 250V
1208	4822 071 53151 ⚠	Fuse T315mA 250V
1322	4822 267 31176	Loudspeaker Socket
1324	4822 265 11547	Headphone Socket
1431	4822 276 13775	Tact Switch
1432	4822 276 13775	Tact Switch
1433	4822 276 13775	Tact Switch
1434	4822 276 13775	Tact Switch
1435	4822 276 13775	Tact Switch
1507	4822 265 20553	Aux-in Socket
1508	4822 265 10981	Flex Socket 15pin Vert.
1509	4822 265 10981	Flex Socket 15pin Vert.
1510	4822 265 11532	Flex Socket 9pin Vert.
1518	4822 267 10953	Flex Socket 7pin Vert.

CAPACITORS

2220	5322 121 42386	100nF 5% 63V
2221	5322 121 42386	100nF 5% 63V
2222	4822 124 40242	1µF 20% 63V
2223	4822 124 40242	1µF 20% 63V
2224	4822 121 51399	47nF 10% 50V
2225	4822 124 40784	3300µF 20% 16V
2226	4822 124 22263	220µF 20% 25V
2227	4822 124 40255	100µF 20% 63V
2228	4822 124 41751	47µF 20% 50V
2229	5322 121 42386	100nF 5% 63V
2243	4822 124 80563	4700µF 20% 35V
2245	4822 123 14024	1000µF 20% 16V
2246	5322 122 34123	1nF 10% 50V
2247	5322 122 34123	1nF 10% 50V
2248	4822 124 40433	47µF 20% 25V
2321	5322 122 32531	100pF 5% 50V
2322	5322 122 32531	100pF 5% 50V
2323	4822 124 40242	1µF 20% 63V
2324	4822 124 40242	1µF 20% 63V
2327	5322 122 34099	470pF 10% 63V
2328	5322 122 34099	470pF 10% 63V
2331	4822 122 33575	220pF 5% 63V
2332	4822 122 33575	220pF 5% 63V
2333	4822 124 40433	47µF 20% 25V
2334	4822 124 40433	47µF 20% 25V
2335	4822 122 32535	680pF 10% 63V
2336	4822 122 32535	680pF 10% 63V
2337	4822 124 40769	4,7µF 20% 100V
2338	4822 124 40769	4,7µF 20% 100V
2339	4822 124 40433	47µF 20% 25V
2340	5322 126 10223	4,7nF 10% 63V
2341	4822 122 32535	680pF 10% 63V
2342	4822 124 81029	100µF 20% 25V
2343	5322 122 32658	22pF 5% 50V
2344	5322 122 32658	22pF 5% 50V
2345	4822 126 13196	100nF 10% 25V
2346	4822 126 13196	100nF 10% 25V
2347	4822 121 42408	220nF 5% 63V
2348	4822 121 42408	220nF 5% 63V
2349	4822 121 42408	220nF 5% 63V
2350	4822 121 42408	220nF 5% 63V
2353	4822 124 22263	220µF 20% 25V
2354	4822 124 40769	4,7µF 20% 100V
2355	4822 122 33175	2,2nF 20% 50V
2356	4822 124 40242	1µF 20% 63V
2357	4822 124 40433	47µF 20% 25V
2358	4822 122 33177	10nF 20% 50V
2359	4822 122 33177	10nF 20% 50V
2360	5322 122 32654	22nF 10% 63V
2361	5322 122 32654	22nF 10% 63V
2362	4822 122 32535	680pF 10% 63V
2363	4822 122 32535	680pF 10% 63V
2364	4822 122 32535	680pF 10% 63V
2365	4822 122 32535	680pF 10% 63V
2400	5322 122 32448	10pF 5% 63V
2401	5322 122 32448	10pF 5% 63V
2402	5322 122 34123	1nF 10% 50V
2405	4822 124 40433	47µF 20% 25V
2501	5322 122 32268	470pF 10% 50V
2502	5322 122 32268	470pF 10% 50V
2503	4822 124 41579	10µF 20% 50V
2504	4822 124 41579	10µF 20% 50V
2505	4822 124 41751	47µF 20% 50V
2507	4822 124 81151	22µF 50V
2508	4822 124 40242	1µF 20% 63V
2509	4822 124 40242	1µF 20% 63V
2510	5322 122 34099	470pF 10% 63V
2511	5322 122 34099	470pF 10% 63V
2512	5322 122 34099	470pF 10% 63V
2513	5322 122 34099	470pF 10% 63V
2514	4822 126 10002	100nF 20% 25V
2515	4822 126 10002	100nF 20% 25V
2520	5322 122 34123	1nF 10% 50V
2521	5322 122 34123	1nF 10% 50V
2524	5322 122 32659	33pF 5% 50V
2525	5322 122 32659	33pF 5% 50V
2530	4822 126 13691	27pF 1% 63V
2531	4822 126 13691	27pF 1% 63V
2532	5322 122 34099	470pF 10% 63V
2533	5322 122 34099	470pF 10% 63V
2534	5322 122 31865	1,5nF 10% 63V
2535	5322 122 31865	1,5nF 10% 63V
2536	4822 124 80195	470µF 20% 10V
2537	4822 126 10002	100nF 20% 25V
2538	4822 126 10002	100nF 20% 25V
2539	5322 122 32654	22nF 10% 63V

2540	5322 122 32654	22nF 10% 63V
2541	4822 126 13751	47nF 10% 63V
2542	4822 126 13751	47nF 10% 63V
2545	4822 126 10002	100nF 20% 25V
2546	4822 126 10002	100nF 20% 25V
2547	4822 124 41584	100µF 20% 10V
2549	4822 126 10002	100nF 20% 25V
2550	4822 126 10002	100nF 20% 25V
2551	4822 124 40242	1µF 20% 63V
2552	4822 124 40242	1µF 20% 63V
2553	4822 122 33805	330pF 10% 63V
2554	4822 122 33805	330pF 10% 63V
2555	4822 122 33805	330pF 10% 63V
2556	4822 122 33805	330pF 10% 63V
2559	4822 124 40242	1µF 20% 63V
2560	4822 124 40242	1µF 20% 63V
2564	4822 122 33805	330pF 10% 63V
2565	4822 122 33805	330pF 10% 63V
2566	4822 126 10002	100nF 20% 25V
2567	5322 122 32654	22nF 10% 63V
2568	4822 126 13694	68pF 1% 63V
2569	4822 126 13694	68pF 1% 63V
2570	4822 122 32535	680pF 10% 63V
2571	4822 122 32535	680pF 10% 63V
2572	4822 126 10002	100nF 20% 25V
2573	4822 124 40769	4,7µF 20% 100V
2574	4822 124 40769	4,7µF 20% 100V
2577	4822 124 80195	470µF 20% 10V
2578	4822 124 81029	100µF 20% 25V
2579	4822 124 40433	47µF 20% 25V
2580	4822 124 41579	10µF 20% 50V
2581	4822 124 80195	470µF 20% 10V
2584	4822 126 13692	47pF 1% 63V
2585	4822 126 13692	47pF 1% 63V
2588	4822 122 32535	680pF 10% 63V
2589	4822 122 33805	330pF 10% 63V
2591	4822 122 32535	680pF 10% 63V
2592	4822 122 32535	680pF 10% 63V
2593	4822 126 13692	47pF 1% 63V
2594	4822 126 13692	47pF 1% 63V
2598	4822 122 33805	330pF 10% 63V
2599	4822 126 11585	22nF +80-20% 25V
2600	4822 126 11585	22nF +80-20% 25V
2652	5322 122 32654	22nF 10% 63V
2653	5322 122 32654	22nF 10% 63V
2654	5322 122 32654	22nF 10% 63V

RESISTORS

3209	4822 051 20478	4R7 5% 0,1W
3210	4822 051 20478	4R7 5% 0,1W
3212	4822 051 20109	10R 5% 0,1W
3213	4822 051 10102	1k 2% 0,25W
3214	4822 051 20478	4R7 5% 0,1W
3215	4822 051 20478	4R7 5% 0,1W
3242	4822 051 20478	4R7 5% 0,1W
3243	4822 051 20478	4R7 5% 0,1W
3246	4822 116 52191	33R 5% 0,5W
3247	4822 051 20339	33R 5% 0,1W
3248	4822 116 52199	68R 5% 0,5W
3249	4822 051 20339	33R 5% 0,1W
3251	4822 117 10833	10k 1% 0,1W
3252	4822 051 10102	1k 2% 0,25W
3253	4822 051 20109	10R 5% 0,1W
3254	4822 051 20109	10R 5% 0,1W
3256	4822 116 83864	10k 5% 0,5W
3257	4822 116 83864	10k 5% 0,5W
3258	4822 116 52283	4k7 5% 0,5W
3264	4822 116 52289	5k6 5% 0,5W
3265	4822 116 52257	22k 5% 0,5W
3266	4822 116 83872	220R 5% 0,5W
3268	4822 116 83872	220R 5% 0,5W
3269	4822 116 52256	2k2 5% 0,5W
3270	4822 117 10833	10k 1% 0,1W
3271	4822 117 10833	10k 1% 0,1W
3272	4822 051 20472	4k7 5% 0,1W
3273	4822 117 11449	2k2 1% 0,1W
3274	4822 051 20472	4k7 5% 0,1W
3275	4822 051 20472	4k7 5% 0,1W
3276	4822 051 20393	39k 5% 0,1W
3277	4822 117 10834	47k 1% 0,1W
3278	4822 051 10102	1k 2% 0,25W
3279	4822 051 10102	1k 2% 0,25W
3280	4822 051 10102	1k 2% 0,25W
3281	4822 051 10102	1k 2% 0,25W
3282	4822 117 10833	10k 1% 0,1W
3283	4822 051 20121	120R 5% 0,1W
3321	4822 116 52256	2k2 5% 0,5W
3322	4822 116 52256	2k2 5% 0,5W
3325	4822 051 20104	100k 5% 0,1W
3326	4822 051 20104	100k 5% 0,1W
3329	4822 051 20472	4k7 5% 0,1W
3330	4822 051 20472	4k7 5% 0,1W
3331	4822 117 11383	12k 1% 0,1W
3332	4822 117 11383	12k 1% 0,1W
3333	4822 117 11449	2k2 1% 0,1W
3334	4822 117 11449	2k2 1% 0,1W
3335	4822 051 20273	27k 5% 0,1W
3336	4822 051 20273	27k 5% 0,1W
3337	4822 051 20479	47R 5% 0,1W
3338	4822 051 20479	47R 5% 0,1W
3339	4822 051 20479	47R 5% 0,1W
3340	4822 051 20479	47R 5% 0,1W
3341	4822 051 10102	1k 2% 0,25W
3342	4822 051 10102	1k 2% 0,25W

ELECTRICAL PARTS LIST - COMBI BOARD

RESISTORS

3343	4822 051 20154	150k 5% 0,1W
3344	4822 051 20154	150k 5% 0,1W
3345	4822 117 11507	6k8 1% 0,1W
3346	4822 117 11507	6k8 1% 0,1W
3347	4822 117 10833	10k 1% 0,1W
3348	4822 117 10833	10k 1% 0,1W
3349	4822 117 10833	10k 1% 0,1W
3350	4822 117 10833	10k 1% 0,1W
3351	4822 051 20228	2R2 5% 0,1W
3352	4822 051 20228	2R2 5% 0,1W
3353	4822 051 20228	2R2 5% 0,1W
3354	4822 051 20228	2R2 5% 0,1W
3361	4822 116 52249	1k8 5% 0,5W
3362	4822 116 52249	1k8 5% 0,5W
3363	4822 116 52249	1k8 5% 0,5W
3364	4822 116 83883	470R 5% 0,5W
3365	4822 116 83872	220R 5% 0,5W
3366	4822 116 52283	4k7 5% 0,5W
3372	4822 051 20109	10R 5% 0,1W
3373	4822 116 52219	330R 5% 0,5W
3378	4822 051 20106	10M 5% 0,1W
3379	4822 051 20472	4k7 5% 0,1W
3380	4822 051 20392	3k9 5% 0,1W
3381	4822 116 52175	100R 5% 0,5W
3382	4822 051 20153	15k 5% 0,1W
3383	4822 051 20223	22k 5% 0,1W
3384	4822 051 20223	22k 5% 0,1W
3385	4822 117 10834	47k 1% 0,1W
3386	4822 117 10834	47k 1% 0,1W
3387	4822 051 20562	5k6 5% 0,1W
3388	4822 051 20562	5k6 5% 0,1W
3390	4822 051 20008	0R Jumper 0805
3401	4822 117 11449	2k2 1% 0,1W
3402	4822 117 11449	2k2 1% 0,1W
3403	4822 117 11449	2k2 1% 0,1W
3404	4822 117 11449	2k2 1% 0,1W
3406	4822 117 11449	2k2 1% 0,1W
3407	4822 117 11449	2k2 1% 0,1W
3409	4822 051 20562	5k6 5% 0,1W
3410	4822 051 20562	5k6 5% 0,1W
3411	4822 116 52175	100R 5% 0,5W
3412	4822 116 52175	100R 5% 0,5W
3413	4822 116 52175	100R 5% 0,5W
3450	4822 051 20331	330R 5% 0,1W
3451	4822 051 20331	330R 5% 0,1W
3452	4822 051 20331	330R 5% 0,1W
3501	4822 051 20683	68k 5% 0,1W
3502	4822 051 20683	68k 5% 0,1W
3509	4822 051 20683	68k 5% 0,1W
3510	4822 051 20683	68k 5% 0,1W
3517	4822 117 10833	10k 1% 0,1W
3518	4822 051 20333	33k 5% 0,1W
3519	4822 051 20333	33k 5% 0,1W
3522	4822 051 20105	1M 5% 0,1W
3523	4822 051 20105	1M 5% 0,1W
3524	4822 051 20104	100k 5% 0,1W
3525	4822 051 20104	100k 5% 0,1W
3526	4822 051 20273	27k 5% 0,1W
3527	4822 051 20273	27k 5% 0,1W
3528	4822 117 10833	10k 1% 0,1W
3529	4822 117 10833	10k 1% 0,1W
3530	4822 051 20333	33k 5% 0,1W
3531	4822 051 20333	33k 5% 0,1W
3534	4822 051 20104	100k 5% 0,1W
3535	4822 051 20104	100k 5% 0,1W
3536	4822 117 10833	10k 1% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 11149	82k 1% 0,1W
3539	4822 117 11149	82k 1% 0,1W
3540	4822 051 20154	150k 5% 0,1W
3541	4822 051 20154	150k 5% 0,1W
3542	4822 116 52176	10R 5% 0,5W
3543	4822 051 20474	470k 5% 0,1W
3544	4822 051 20474	470k 5% 0,1W
3545	4822 051 20104	100k 5% 0,1W
3546	4822 051 20104	100k 5% 0,1W
3547	4822 051 20471	470R 5% 0,1W
3548	4822 051 20471	470R 5% 0,1W
3549	4822 051 20472	4k7 5% 0,1W
3551	4822 051 20228	2R2 5% 0,1W
3552	4822 051 20228	2R2 5% 0,1W
3553	4822 051 20223	22k 5% 0,1W
3554	4822 051 20223	22k 5% 0,1W
3556	4822 117 12955	2k7 1% 0,1W
3557	4822 117 12955	2k7 1% 0,1W
3558	4822 051 20105	1M 5% 0,1W
3559	4822 051 20105	1M 5% 0,1W
3560	4822 051 20471	470R 5% 0,1W
3561	4822 051 20471	470R 5% 0,1W
3562	4822 051 20822	8k2 5% 0,1W
3563	4822 051 20822	8k2 5% 0,1W
3564	4822 051 20391	390R 5% 0,1W
3565	4822 051 20391	390R 5% 0,1W
3566	4822 051 20153	15k 5% 0,1W
3567	4822 051 20153	15k 5% 0,1W
3568	4822 051 20153	15k 5% 0,1W
3569	4822 051 20153	15k 5% 0,1W
3570	4822 117 10833	10k 1% 0,1W
3571	4822 117 10833	10k 1% 0,1W
3574	4822 051 20223	22k 5% 0,1W
3575	4822 051 20223	22k 5% 0,1W
3576	4822 117 11507	6k8 1% 0,1W
3577	4822 117 11507	6k8 1% 0,1W
3580	4822 051 20223	22k 5% 0,1W

ELECTRICAL PARTS LIST - COMBI BOARD

3581	4822 051 20223	22k 5% 0,1W
3582	4822 117 12955	2k7 1% 0,1W
3583	4822 117 12955	2k7 1% 0,1W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 20479	47R 5% 0,1W
3586	4822 117 11449	2k2 1% 0,1W
3587	4822 117 11507	6k8 1% 0,1W
3588	4822 051 20471	470R 5% 0,1W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3596	4822 051 20683	68k 5% 0,1W
3597	4822 051 20683	68k 5% 0,1W
3601	4822 116 83884	47k 5% 0,5W
3602	4822 116 83884	47k 5% 0,5W
3603	4822 051 20105	1M 5% 0,1W
3604	4822 051 20105	1M 5% 0,1W
3605	4822 051 20104	100k 5% 0,1W
3606	4822 051 20104	100k 5% 0,1W
3609	4822 116 83883	470R 5% 0,5W
3610	4822 116 83883	470R 5% 0,5W
3616	4822 051 20104	100k 5% 0,1W
3617	4822 117 11139	1k5 1% 0,1W
3618	4822 117 11139	1k5 1% 0,1W
3640	4822 051 20273	27k 5% 0,1W
3656	4822 051 20008	0R Jumper 0805
3657	4822 051 20008	0R Jumper 0805
4214	4822 051 20008	0R Jumper 0805
4217	4822 051 20008	0R Jumper 0805
4221	4822 051 20008	0R Jumper 0805
4226	4822 051 20008	0R Jumper 0805
4244	4822 051 20008	0R Jumper 0805
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4552	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4560	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4564	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4566	4822 051 20008	0R Jumper 0805
4567	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4569	4822 051 20008	0R Jumper 0805
4570	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4572	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4575	4822 051 20008	0R Jumper 0805
4579	4822 051 20008	0R Jumper 0805
4580	4822 051 20008	0R Jumper 0805
4677	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - COMBI BOARD

COILS & FILTERS

5202	4822 157 71285	Coil 400µH 30%
5321	4822 157 11477	Coil 2,2µH 5%
5322	4822 157 11477	Coil 2,2µH 5%
5324	4822 157 11477	Coil 2,2µH 5%
5502	4822 157 11477	Coil 2,2µH 5%
5503	4822 157 62255	Coil 18,5 Turns
5504	4822 157 62255	Coil 18,5 Turns
5505	4822 157 62255	Coil 18,5 Turns
5506	4822 157 62255	Coil 18,5 Turns
5507	4822 157 11477	Coil 2,2µH 5%
5508	4822 526 10704	Fe Bead 100MHz
5522	4822 157 11477	Coil 2,2µH 5%
5523	4822 157 11477	Coil 2,2µH 5%

DIODES

6220	4822 130 31878	1N4003G
6221	4822 130 31878	1N4003G
6222	4822 130 31878	1N4003G
6223	4822 130 31878	1N4003G
6224	4822 130 31878	1N4003G
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 34173	BZX79-B5V6
6229	4822 130 34379	BZX79-B27
6230	4822 130 31878	1N4003G
6231	4822 130 34174	BZX79-B4V7
6232	4822 130 30621	1N4148
6233	4822 130 30621	1N4148
6236	4822 130 34233	BZX79-B5V1
6240	4822 130 31878	1N4003G
6241	4822 130 31878	1N4003G
6242	4822 130 31878	1N4003G
6243	4822 130 31878	1N4003G
6244	4822 130 31878	1N4003G
6245	4822 130 31878	1N4003G
6248	4822 130 31878	1N4003G
6249	4822 130 31878	1N4003G
6250	4822 130 31878	1N4003G
6251	4822 130 31878	1N4003G
6257	4822 130 30621	1N4148
6258	4822 130 34173	BZX79-B5V6
6269	4822 130 30621	1N4148
6321	4822 130 31878	1N4003G
6322	4822 130 31878	1N4003G
6323	4822 130 31878	1N4003G
6324	4822 130 31878	1N4003G
6325	4822 130 34281	BZX79-B15
6326	4822 130 31024	BZX79-B18
6327	5322 130 31504	BZX79-B3V3
6328	4822 130 31878	1N4003G
6329	4822 130 30621	1N4148
6330	4822 130 30621	1N4148
6442	4822 130 10792	LTL-1CHPE
6443	4822 130 10792	LTL-1CHPE
6444	4822 130 10792	LTL-1CHPE
6502	4822 130 34173	BZX79-B5V6
6549	4822 130 30621	1N4148
6550	4822 130 30621	1N4148
6551	4822 130 30862	BZX79-B9V1
6552	4822 130 30621	1N4148
6553	4822 130 31878	1N4003G

TRANSISTORS & INTEGRATED CIRCUITS

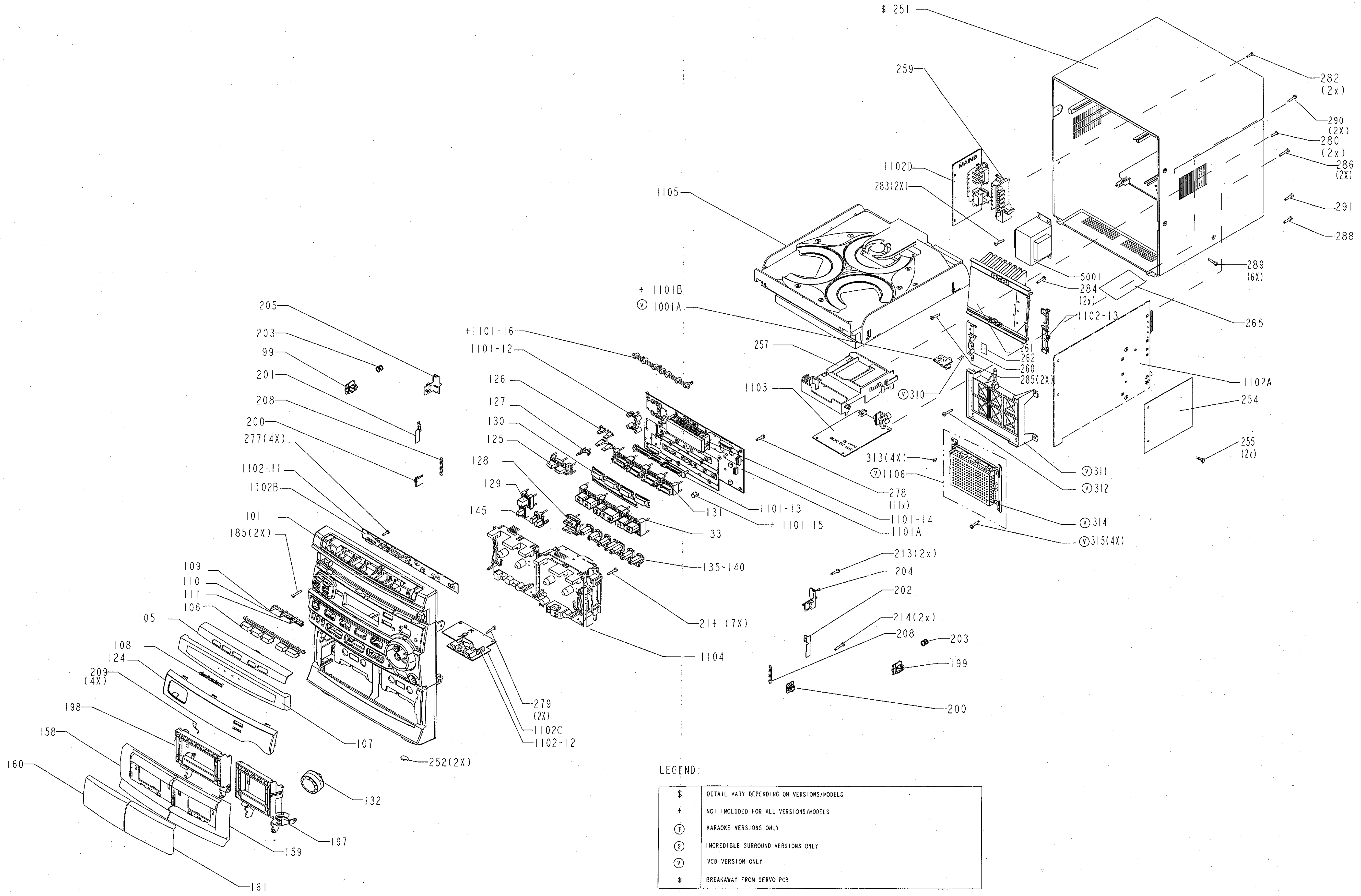
7233	4822 130 63575	BD242BFI
7236	4822 130 41246	BC327-25
7237	4822 130 40959	BC547B
7238	4822 130 60511	BC847B
7239	4822 130 42804	BC817-25
7240	4822 130 40959	BC547B
7241	4822 130 40959	BC547B
7247	4822 130 40981	BC337-25
7248	4822 130 40981	BC337-25
7249	4822 130 41246	BC327-25
7320	4822 130 42804	BC817-25
7321	4822 130 42804	BC817-25
7322	4822 130 42804	BC817-25
7323	4822 130 42804	BC817-25
7329	4822 130 10847	BDW94C
7330	4822 130 40959	BC547B
7331	5322 130 60508	BC857B
7332	5322 130 60508	BC857B
7333	4822 130 42804	BC817-25
7391	4822 209 16224	AN7125
7400	5322 130 60508	BC857B
7401	4822 130 40981	BC337-25
7402	5322 209 11306	HEF4094BT
7501	5322 209 11102	HEF4052BT
7503	4822 130 41096	BC550C
7504	4822 130 41096	BC550C
7505	4822 130 44568	ON4986
7506	4822 130 44568	ON4986
7507	4822 130 44568	ON4986
7508	4822 130 44568	ON4986
7530	5322 209 14482	HEF4069UBT
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7543	4822 130 60511	BC847B
7544	4822 130 60511	BC847B
7545	4822 130 60511	BC847B
7546	4822 130 60511	BC847B
7547	4822 130 60511	BC847B
7548	4822 130 60511	BC847B
7554	4822 209 31378	NJM4556MB

ELECTRICAL PARTS LIST - COMBI BOARD

7556	5322 130 60508	BC857B

Note: Only the parts mentioned in this list are normal service spare parts.

EXPLODED VIEW - MAIN UNIT


$ 251
259
282 (2x)
290 (2X)
280 (2x)
286 (2X)
291
288
1102D
283(2X)
1105
5001
284 (2x)
289 (6X)
265
+ 1101B
Ⓥ 1001A
1102-13
261
262
260
285(2X)
1102A
254
255 (2x)
257
Ⓥ310
1103
313(4X)
Ⓥ1106
Ⓥ311
Ⓥ312
Ⓥ314
Ⓥ315(4X)
+1101-16
1101-12
126
127
130
125
128
129
145
131
133
135~140
1101-13
+ 1101-15
278 (11x)
1101-14
1101A
214 (7X)
1104
213(2x)
204
202
214(2x)
208
203
199
200
205
203
199
201
208
200
277(4X)
1102-11
1102B
101
185(2X)
109
110
111
106
105
108
124
209 (4X)
198
158
160
107
279 (2X)
1102C
1102-12
252(2X)
132
197
159
161
MAINS

LEGEND:

$	DETAIL VARY DEPENDING ON VERSIONS/MODELS
+	NOT INCLUDED FOR ALL VERSIONS/MODELS
Ⓣ	KARAOKE VERSIONS ONLY
Ⓢ	INCREDIBLE SURROUND VERSIONS ONLY
Ⓥ	VCD VERSION ONLY
*	BREAKAWAY FROM SERVO PCB

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

101	4822 459 05323	Cabinet Front
105	4822 450 10631	Window CDC Control
106	4822 410 12346	Button CDC Select
107	4822 442 01682	Cover Tray CDC
108	4822 454 13035	Badge Philips
124	4822 450 10683	Window Display
125	4822 410 12198	Button DSC/DBB
128	4822 410 12494	Button Set Clk/RDS/News
129	4822 410 12347	Button Power/HSD
130	4822 380 10266	Lightguide Source Select
131	4822 410 11643	Button Source Select
132	4822 410 12538	Volume Knob
133	4822 410 11729	Button Set Controls
145	4822 410 12326	Button Set Replay/Rec
158	4822 443 11255	Cover Cassette Left
159	4822 443 11256	Cover Cassette Right
160	4822 381 11941	Lens Cassette Left
161	4822 381 11942	Lens Cassette Right
197	4822 443 10488	Door Cassette Right
198	4822 443 10487	Door Cassette Left
199	4822 402 10621	Push-Catch
200	4822 529 10322	Damper Assembly
203	4822 492 11344	Spring Compression
204	4822 402 11246	Bracket Right
205	4822 402 11245	Bracket Left
208	4822 492 11345	Spring Tension
209	4822 492 42787	Spring Cassette
251	4822 426 10909	Cabinet Rear /22
251	4822 426 10781	Cabinet Rear /34
252	4822 462 40683	Plate (Foot)
255	4822 466 93148	Spacer 5mm
260	4822 492 11734	Spring IC
350	4822 445 10852	L/R Loudspeaker Box
351	4822 303 50063	FM Aerial
356	4822 219 10666	Rem. Control RC282422/01B
384	4822 303 50082	AM Frame
385	4822 321 10249 ⚠	Mains Cord
387	4822 736 17076	Instruction For Use /22
387	4822 736 17075	Instruction For Use /34
1451	4822 320 12604	Flex Cable 9pin 22cm
1455	4822 320 12654	Flex Cable 7pin 22cm
1456	4822 320 11974	Flex Cable 15pin 19cm
1557	4822 320 12663	Flex Cable 7pin 34cm
5001	4822 146 11174 ⚠	Mains Transformer

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

4822 240 10376	Woofer 4" 6R 12W
4822 248 10007	Piezo + Wire Assembly

Note: Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

185	D3 x 12
211	D3 x 12
213	D3 x 12
214	D3 x 12
277	D3 x 12
278	D3 x 12
279	D3 x 12
280	D3 x 12
282	D3 x 12
283	D3 x 16
284	M3 x 15
285	D3 x 16
286	D3 x 12
288	D3 x 12
289	D3 x 10
290	D3 x 12
293	M3 x 6